ECONOMIC IMPACT ANALYSIS OF EXCHANGE RATE, RFS2, AND FARM PROGRAM SUPPORT CHANGES ON THE U.S. CROP SECTOR

A Dissertation

by

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Submitted to the Office of Graduate and Professional Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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August 2014

Major Subject: Agricultural Economics

ABSTRACT

This dissertation aims at analyzing the expected consequences resulting from an exchange rate change, the Renewable Fuel Standard 2 (RFS2), and removing farm price and income supports in the 2014 Farm Bill. This study establishes a dynamic, recursive, partial equilibrium crop model containing 14 commodities to analyze economic impacts of external shocks on the U.S. crop sector. The concept of expected net returns (ENRs) based on economic theory is introduced to account for producers' decision makings in response to external shocks and the supply-demand structure embedded in the entire sector. Model validation results support that the proposed model reasonably replicates the historical data.

The baseline forecast results indicate that the price, planted acres, production, demand, and ENRs for most commodities will be stabilized around 2014-2016. Compared to the baseline, incorporating the exchange rate changes and the RFS2 is expected to influence the demand side, whereas the forthcoming Farm Bill is likely to largely affect the supply side via changing the ENRs. Impacts of the exchange rate changes are forecasted to be substantial, but vary by crop. The 2014 Farm Bill is forecasted to contribute to the goal of budget reductions, at the expense of lower ENRs.

The impact analysis can be applied to most major crops at the national and regional level. This nested information is expected to help policy makers with their decision makings. A successful incorporation of important and relevant sectors such as the U.S. livestock sector, international trade, and climate change will improve the

proposed model's performance and forecasting results. This further development remains as future work.

DEDICATION

To my family.

ACKNOWLEDGEMENTS

I would like to acknowledge the inspirational instruction and guidance of Drs. Bryant and Richardson. Without their continued support and council, I could not have finished my academic process at Texas A&M University. Thanks to my committee members, Drs. Bessler and Wehrly for their guidance and support throughout the course of this research.

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CHAPTER I

INTRODUCTION

Statement of Problem

Policy makers need to know about the consequences of alternative policies. The U.S. Congress wrote a new Farm Bill to replace the 2008 Farm Bill. Issues of importance are the impacts of the exchange rate changes on U.S. agricultural exports, the impacts of changing the Renewable Fuel Standard 2 (RFS2), and the impacts of removing farm price and income supports.

The European Union (EU) has struggled with an economic crisis triggered in 2008, which has been worsened by a financial crisis of its member countries (Greece, Italy, Spain etc). The average GDP growth rate has fallen from 2.92% in 2004-2007 to -0.01% in 2008-2011 (IMF 2012) and Euro-U.S. dollar exchange rate after reaching its peak in July 2008, has depreciated by 19.1% by the end of 2011. A serious shrinkage of U.S. agricultural commodity imports by EU-27 (2.2 billion Euros in 2008 to 1.4 billion Euros in 2010) also underpins aftermath of the crisis and a strengthened U.S. dollar (European Commission). As the crisis worsens, the prospects of a strong dollar will likely reduce U.S. agricultural exports. Because the agricultural export accounts for 10.8% of total U.S. exports in 2011 (USDA ERS 2014; U.S. Census Bureau 2013), analyzing recent changes in the fifth largest market for U.S. agriculture (9.4% over the last decade; USDA FAS 2013) and their impacts on U.S. exports and agricultural sector should be of considerable interest to policy makers.

Since the U.S. Environmental Protection Agency (EPA) released the final documentation regarding the Renewable Fuel Standard 2 (RFS2) in 2011, this revised standard has been the center of controversy. Advocates insist that the RFS2 is expected to reduce the life cycle emission of greenhouse gas (GHG) by 20~60% and that it contributes to mitigating U.S. dependence on foreign fossil energy (EPA, 2010; Bryant and Outlaw 2006). Opponents are suspicious of the profitability and sustainability of this alternative energy (especially those of biodiesel) in that a biofuel sector is highly dependent on government programs (Elam 2008; Kouplow 2006). The RFS2 requires mandatory use of biofuels to increase to 36 billion gallons per year (with a maximum of 15 billion gallons for corn-based ethanol) by 2022 (EPA). As pointed out by the Biofuels Interagency Working Group (2010), the current production situation is not favorable for meeting the target. The long-term projections (USDA 2011; EPA 2011) indicate that about 35~41% of domestic corn production would have to be allocated to ethanol. Considering a lack of advanced biofuels production and technology available so far, more corn and soybeans have to be produced to meet the required threshold. Congress needs information regarding the impacts of changes in the RFS2.

. Since 2000, the U.S. federal budget deficits increased to reach $1.3 trillion in 2011 (OMB). Based on past experience, this undesirable situation is likely to increase pressures to reduce supports/subsidies for U.S. agriculture (Young and Westcott 1996; Arha et al 2006; Darrat 1988; Normile *et al* 2004). The change may be represented in a recent budget plan proposed by House Budget Committee Chairperson Paul Ryan (‘Ryan Proposal’) in March 2012 suggesting that reducing the Farm Bill budget by $181 billion by 2022 is required. Given a strong dependence of the sector on price and income payments[1], taking subsidies away may have massive impacts on the agricultural sector. For example, eliminating Direct Payments (DP), $4.7 billion in 2011, will decrease the average revenue per acre by about $17.8 (CBO 2012; USDA ERS 2012). This reduced revenue may increase difficulties with debt repayment and replacement of machinery for agricultural producers. The impacts of support payment cuts are likely to be uneven across regions and crops. In 2011, total expenditures for cotton and rice DP were $950 million or about a half of the Direct Payments (DP) paid to corn ($1,895 million). Average payments per acre are much higher for cotton ($43.2/acre) and rice ($137.1/acre) than for corn ($24.2/acre). It might be anticipated that reducing program payments will have differential impacts, much larger for cotton and rice. Another suggestion of limiting coverage of crop insurance in the Ryan Proposal may increase the risk and vulnerability of agricultural producers.

The three policy shifters discussed above will affect the U.S. farm economy in several ways; for example, price, production, domestic and export demand, farm income, land values, and farm structures. In this sense, the impacts of the EU crisis, pressure to reconsider the RFS2, and reducing federal budget deficits by cutting price and income supports need to be carefully analyzed.

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1 Price and income support payments for the U.S. agricultural sector reached $5.3 billion in 2010.

Objectives of the Study

The objective of this study is to analyze the economic impacts of exchange rate changes, changes in the renewable energy policy, and pressures on the agricultural supports reduction due to federal budget deficits. To achieve this objective, this study will conduct the following:

1. Analyze the impacts of a strengthened U.S. dollar on agricultural exports and corresponding U.S. farm economy.

2. Analyze the impacts of current RFS2 and its prospected subsequent changes on the demand for major energy crops (corn and soybean).

3. Analyze the national and differential regional impacts of the 2014 Farm Bill which substantially reduces price and income supports.

CHAPTER II

LITERATURE REVIEW

Impacts of the Exchange Rate Changes on Agricultural Exports and Sector

Prior to Schuh (1974), few studies had paid attention to the impacts of exchange rate policies on agricultural trade. Schuh criticizes traditional studies for overlooking the role of exchange rates and provides a conceptual framework regarding how exchange rates affect trade. Using an induced technical change model, he argues that changes in exchange rates may affect U.S. agricultural exports and structures in two ways; (1) appreciating U.S. dollar works to raise commodity prices in terms of foreign currency and to reduce quantity demanded, (2) agricultural producers begin to adopt technological innovation to adjust the lowered prices and reduced quantity, which, in the longer term, affects the sector structure such as land values and farm size. In spite of not providing an empirical analysis, his study supports the incorporation of exchange rates into the proposed trade impact. Schuh’s (1974) contribution to the literature was explaining how overvaluation of U.S. dollar had worked against U.S. agricultural exports. Subsequent studies accept the approach suggested by Schuh and conduct empirical analyses of the impacts of exchange rate changes on U.S. trade (Clark 1974; Greenshields 1974; Vellianitis-Fidas 1976). Orden (2002) makes a review of Schuh (1974) to argue that agricultural and trade policies can affect both domestic and foreign markets and that real exchange rate change can have substantial effects on agricultural trade. Frank and Garcia (2010) and Harri, Nalley, and Hudson (2009) argue that both energy factors and exchange rates have substantial effects on agricultural trade via inter-market linkages. Kim, Cho, and Koo (2004) and Batten and Belongia (1986) support the impact of exchange rate on agricultural trade magnitude and farm income under the bilateral case. Using 1983-2000 quarterly data, they show that the exchange rate has significant impacts on the trade volume while it has insignificant and negligible effects on the farm income. Kost (1976) build a theoretical model to investigate the effects of devaluation on trade for agricultural and non-agricultural sectors. Assuming a free trade regime and no governmental intervention, the study argues that the weaker currency of an exporting country will have a small impact on the agricultural sector, and that the effects are more manifest for price than trade volumes.

Chambers (1979) indicates that no consensus has been reached on the degree of impacts of exchange rate changes on agricultural trade and that the discordance is due to restrictive assumptions in model specification, e.g., zero cross-price elasticity. Their study provides several alternative specifications for consistent estimation with fewer restrictions. They also show that including exchange rates separately and including weighted price indices may resolve econometric specification problems.

Chambers and Just (1981) extend previous studies by building dynamic structural and reduced-form models to analyze the effects of U.S. dollar devaluation on U.S. agricultural exports, disappearance, inventories, and production. The models are estimated by 3Stage Least Square (3SLS) using the quarterly data of wheat, corn, and soybeans for the period 1969 (I) – 77(II). The results indicate that a weakened U.S. dollar works to increase exports, raise prices, and reduce domestic disappearance and inventories. The remarkable feature of their 1981 study is that evaluating dynamic effects is consistent with the hypothesis that agricultural producers may not adjust instantaneously to external changes, and that the impacts of exchange rate changes may last more than one period. In this sense, using their approach in this study and analyzing the impacts of exchange rates should be considered.

Collins et al (1980) argue that a trade analysis model should contain not only multilateral exchange rate changes but also prices of competing commodities, rates of inflation and trade restrictions. They analyzed an excess supply-demand model for U.S. wheat, corn, soybean, and cotton trade in the 1970s to evaluate the impacts of the changes on wheat price, production, and consumption. The results show that even if varying upon the degree of 'free' trade, exchange rate changes have substantial effects on U.S. agricultural exports. Bredahl et al (1979) argue that the price transmission elasticities are of importance in analyzing the impacts of exchange rate changes on agricultural exports of several major crops. Their study computes the elasticities of excess supply and demand under 'free' trade, partial trade restriction, and full separation of domestic prices from foreign ones. The results indicate that the estimates under the three conditions provide upper and lower bounds for excess supply/demand elasticities. Under strengthened interdependencies between economies, adopting exchange rate changes along with inflation rates and government policies is important for analyzing the impacts of alternative exchange rates. Setting up upper and lower bounds would enable the analysis in this study to be based on more plausible ranges of response with respect to exchange rate changes.

A number of studies stress the importance of exchange rate risk on agricultural trade. Kandilov (2008) argue that analyzing the impacts of exchange rate changes on agricultural trade needs to incorporate not only the change itself but its volatility. The argument arises from that the higher volatility or risk can substantially and negatively affect the magnitudes of agricultural trade. Maskus (1986) conducts a sectoral analysis of exchange rate risk using the 1974-1984 U.S. trade data. The empirical results demonstrate that the U.S. agricultural trade is more sensitive to real exchange rate risk compared to other sectors, and that the vulnerability may be due to the larger 'openness' of the agricultural sector. Other studies underpin the negative effects of exchange rate volatility on trade by sector including agriculture (Byrne, Darby, and MacDonald 2008; Perée and Steinherr 1989; and Bahmani-Oskooee and Ardalani 2000; Cho, Sheldon, and McCorriston 2002; and Anderson and Garcia 1989). Likewise, Pick (1990) shows that the negative effects of exchange rate risk can be applied to the case of developing countries' agricultural exports.

Impacts of the RFS2 Changes on U.S. Agricultural Sector

Relatively few studies have been conducted regarding the impacts of expanding ethanol production and mandatory use of biofuels on the U.S. agricultural sector. Inherent uncertainties in profitability of biofuels and insufficient observations have kept the various analyses from reaching full agreement. Some studies argue that incentives and regulations for increasing biofuel production have had little or negative impacts on U.S. corn price and production (Gorter and Just 2009) or that the changes cannot be precisely estimated using current data (Miranowski 2007). The majority of studies support the hypothesis of substantial impacts from the changes in biofuel policies on the U.S. agricultural sector.

Several studies argue that the linkage between agricultural and energy markets has become stronger in recent years (Dodder et al 2011; Tyner and Taheripour 2008; Tyner 2010). This change implies that an expected/unexpected shock or change in the energy market can exert substantial influence on the crop market.

Some studies focus on the effects of the RFS on U.S. corn price and production. Gardner (2003) and Bryant and Outlaw (2006) support the positive effects of the RFS1 on corn price and production. They focus on the impacts of biofuel subsidies and farm price supports on farm economies to argue that both renewable energy subsidies and farm price supports are in favor of energy and corn producers at the cost of taxpayers. Gardner (2003) also argues that using a simulation analysis on the derived-demand model for corn, the impacts from adopting the RFS1 can be much larger than impacts of implementing ethanol subsidies. Anderson and Coble (2010) analyze the impact of the RFS on the U.S. corn market under a rational expectation hypothesis. They indicate that the RFS would lead to a kinked demand for corn, which may affect corn price and production differentially depending on the RFS's minimum requirements. Fortenbery and Park (2008) argue that the impacts of the RFS2 changes would be larger for corn price and production than for biofuels because the upstream sectors tend to be more flexible to quantity changes. United States' corn price and production are likely to increase faster than they would have been without the RFS2 changes. The studies fail to consider the impacts of corn price and production changes on other competing crop sectors, mainly soybeans. This study will examine the issues analyzed previously but having the RFS2 as the shock.

The magnitudes of impacts due to the RFS2 implementation vary by studies. Taylor *et al* (2006) and Rajagopal *et al* (2007) used a system approach to analyze the impacts of the RFS changes on a wider range of U.S agriculture. They use a partial equilibrium model consisting of U.S. corn production, domestic/export demand, and inventory equations to analyze the impacts of changes in ethanol production and federal supports. The scenario analysis results based on 1980-2004 data indicate that U.S corn price and production are projected to increase by 3.3~39.6% and 2.4~6.1%. Adopting the RFS2 that requires mandatory uses of more corn-based ethanol would increase the forecasted changes *ceteris peribus*. They analyze the effects of change in the corn market on price and production of wheat and soybean. The result shows that the impacts on gross returns for wheat and soybean would vary but they did not conduct a detailed analysis on this part., Assuming that the effects of the RFS2 might last over time, the sequential feedback impacts from the competing sectors on the corn sector need to be analyzed. Chen *et al* (2011) use Biofuel and Environmental Policy Analysis Model (BEPAM) to estimate the impacts of the RFS2 and tax credits. This study argues that the mandates are forecasted to increase corn price by 24% while working to lower gasoline price compared to the Business As Usual (BAU), and that the regulation is beneficial in terms of social welfare. This study also argues that tax credits mitigate the corn price increments, but are accompanied with social welfare reduction.

Some studies suggest that the expansion of biofuels may arguably transform the conventional competition between food and feed to food-feed-fuel competition (Banerjee 2011). There are some pessimistic studies regarding the feasibility or effectiveness of meeting the RFS in the short and/or long run (Somma, Lobkowicz, and Deason 2010; Lawrence 2010). Ando, Khanna, and Taheripour (2010) argue that the social welfare reduction resulting from the RFS2 ranges from $60 billion and $115 billion, and that continuing tax credits can further increase the deadweight loss. Chen and Khanna (2012) argue that under the RFS2 and/or VEETC, corn prices will be higher by 23.5%~36.8% compared to BAU in 2022. This study also indicates that the continuation of tax credits can further exacerbate consumer surplus loss due to the higher food prices. The argument on the effects of tax credits is in line with Gorter and Just (2009) insisting that the tax credits can work against its intended goal and that they have less advantages than the RFS2. Ferris and Joshi (2004) analyzed the effects of renewable fuel policies on corn and byproduct markets. This study estimated the projected national ethanol demand under the combination of such policies as banning methyl tertiary butyl ether (MTBE), RFS, and ozone standards during 2003-2010. The results demonstrate that implementation of the policies is forecasted to lead the corn price to be higher by up to 18% and that, as a result, corn planted acres usually increase at the cost of soybean planted acres.

Impacts of the Subsidy/Support Reductions on the U.S. Agricultural Sector

A heavy dependence of U.S. agriculture on government payments has caused the sector to be sensitive to farm policy changes. Over the past forty years, a number of studies were conducted to analyze the impacts of farm bill changes on U.S. agriculture (Houck and Ryan 1972; Morzuch, Weaver, and Helmberger 1980; Lee and Helmberger 1985; White and Shideed 1991; Chembezi and Womack 1992; Guyomard et al 1996; Lin *et al.* 2000; Nickerson and Hand 2009).

Lee and Helmberger (1985) use a supply response model subject to producers' program participation to analyze the impacts of the government payments. They set up different response models for participants ("farm program regime") and non-participants ("free market regime"), which are estimated using Zellner's generalized Aitken model for corn and soybeans in selected years. Their results show that the degree of supply response is larger in absolute terms under "farm program regime" implying that agricultural supports have worked to increase farm incomes and that returning to a "free market regime" might lead to substantial changes in crop plantings. Lin *et al.* (2000) analyze allocation changes for eight major crops under the 1996 farm bill using the Policy Analysis System-Economic Research Service (POLYSYS-ERS) model. Their results show that if farm program provisions are removed, the own and cross elasticities of each crop increase, or supply response become more sensitive to market signals and that the effects vary by region and crop. These studies fail to analyze the expected changes for farm incomes at the regional levels. Ching-Cheng *et al.* (1992) demonstrate that such farm programs in the 1996 Farm Bill as target price and loan programs are in favor of producers and consumers via higher and lower prices. They argue that taking a larger magnitude of corresponding social deadweight loss, eliminating the programs may enhance the social welfare.

Farm Bills since the mid-1980s have tried to reduce U.S. agricultural producers' reliance on the government supports (Normile,Effland, and Young 2004). The 1990 Farm Bill retained price and income supports, but reduced portions of price subsidies. The 1996 Farm Bill legislation moved toward a more market-oriented direction by reducing income support measures and ending supply management programs (Young and Westcott 1996). Dmitri, Effland, and Conklin (2005) also stress that the farm program which had emphasized supply controls until the late 1990s shifted to the 'decoupled' payment regime since the 2002 Farm Bill. The policy reforms led the agricultural sector to more market-driven supply responses by reducing market-distorting subsidies and concentrating on farm income stabilization (Johnson, Hanrahan, and Schnepf 2010). Based on OECD's Producer Support Estimates data, the share of total farm support in gross farm receipts in the U.S. dropped from 24% in 1986 to 7% in 2008. MacDonald, Hoppe, and Banker (2006) analyze 1989-2003 survey data to show that 'large' farms whose sales exceed $500,000 had played a larger role in production and that the farms benefited more from farm programs compared to smaller farms. They argue that the shift of more program payments toward the 'large' farm can be partially due to the coupling attributes of programs.

Because U.S. agricultural producers have been encouraged to be more market-oriented, reduced de-coupled payments proposed by the Senate in 2013 suggests that more analyses would be a timely contribution to the legislation. As indicated by Johnson and Monke (2010), in the presence of high price volatilities and positive relationships between government supports and farm income, analyzing the magnitude of budget reductions is of importance. Shaik, Helmers, and Atwood (2005) analyzed 1940-2002 data using a capitalization model to show that program payments increase agricultural land values up to 15~40% and that the impacts vary over time. Additional analysis should consider the relationship between land values and farm incomes, as asset values will be impacted through program payment reductions. Dewbre and Mishra (2002) analyze the effects of selected farm programs (AMTA or Direct Payments and Loan Deficiency Payments) on farm-house income. They argue that AMTA might be less efficient because it may benefit landlords more than producers (transfer) and that LDP can be more efficient to achieve the policy goals. Hennessy (1998) argues that government programs widely used in the U.S. agricultural sector not only support producers' income (wealth effects), but work to mitigate embedded risks (insurance effects). This study also indicates that the two effects combined with what is called 'coupling' effect should be considered when analyzing the effects of the farm programs, especially in terms of affecting planting decisions. Westcott and Young (2012) argue that 'coupled' programs, e.g., crop insurance and marketing loan, have substantial effects on planting decisions and land use, whereas 'decoupled' payments are relatively free from affecting the decisions.

Previous studies support the hypothesis that three issues discussed above affect the U.S. farm economy and structure. Few researchers have analyzed the combined impacts of exchange rates, the RFS2 changes, and farm support reductions. Farm bills kept reducing farm payments, the effects from other two issues are likely to differ from those suggested by previous analyses. In this sense, a system analysis incorporating the impacts of three policy shifters in a holistic agricultural sector should be conducted to provide necessary information for policy makers.

CHAPTER III

METHODOLOGY

Analyzing impacts of changes in exchange rate, the RFS2, and agricultural budget reductions on the U.S. agriculture sector can be conducted by computing equilibrium prices and quantities under each change and measuring subsequent changes in the farm economy. Assuming the U.S. livestock sector and global markets as exogenous factors, this study will estimate structural supply and demand functions for the U.S. field crops to estimate the *status quo* market equilibria (the 'baseline' scenario). Policy changes will have varying effects on price, expected net returns, and farm income by crop and across regions. This study employs a recursive dynamic partial equilibrium model including structural supply and demand equations for major crops.

Crop Supply Sector

Estimating the U.S. crop supply begins with the equations for regional planted acres and expected yields. Harvested acres estimated from planted acres are multiplied by estimated expected yields to calculate the regional production. The supply of a specific crop is calculated by adding the regional production to imports and beginning stocks. This study focuses on ten major program crops and uses a geographical division to simplify and enhance effectiveness of the analysis (table C-1). In each region, crops are considered major crops if their average planted acres are larger than 5% of total cropland during 1985-2012. There are several exceptions where a crop's planted acres are relatively small within a region whereas the regional production is substantial against the crop's production nationwide. For example, oats account for only 1.4% of total planted acres in the Corn Belt during 1985-2012, on average. The average oat production in the Corn Belt accounts for 16.3% of total production during 1985-2012, on average. It is necessary to consider oats produced in the Corn Belt to appropriately estimate oats supply. In such cases, the planted acres and production are assumed to move corresponding to the past 5-years' moving average. The moving average is then added to the estimated planted acres and production to calculate total acres and production (table C-2).

The Regional Division and Major Program Commodity Mix (table C-2) reveals inter-crop competition for limited available cropland in each region. When the expected net returns (ENRs) for a certain crop is higher than other crops in the same region, producers have an incentive to plant more. When other things remain unchanged, planted acres of the crop are likely to increase whereas those of competing crops will decrease. Note that the competition between crops in the same region might not be perfectly symmetric. Switching from a certain crop to another might be more difficult than the other way around. A higher corn ENRs may induce oats producers to plant corn instead of oats in coming years. Corn producers are less likely to make their planting decisions based on the changes in oat ENRs.

In economic theory, agricultural producers depend on expected prices or profits when making decisions on allocating planted acres for each crop. Even if more directly observable, market prices might fail to precisely reflect the main interests of producers

(Lee and Chambers 1986; Key, Sadoulet, and Janvry 2000). Since the commodity prices remain unrealized until they are actually sold, the presence of uncertainties influences the allocation of agricultural resources and supply response (Chavas and Holt 1990; Hardaker et al 2004). This study will use expected net returns (ENRs) as the main determinants for planting decision by producers.

ENRs can be defined as the difference between expected price and expected variable costs, as expressed in the equation (1). This study will regard the cost components as stochastic and recursive because agricultural producers are exposed to input price variations during planting and harvesting seasons. Producers rarely purchase all inputs ahead of planting time, thus exposing themselves to cost risks. It will be more relevant to treat crop prices and production costs (variable production costs in the short run) as stochastic. This study also assumes that the producers base their planting decision on the naïve expectation. The property will enable the proposed model to be recursive and dynamic.

(1) $ENR_{ikt} = E[MP_{ikt}] – E[VC_{ikt}] = MP_{ik,\, t-1} – VC_{ik,\, t-1}$,

where MP = farm price, VC = variable production costs, ε = error term, and subscripts i, j and t represent crop, region, and time.

Government supports should be incorporated into the model through ENRs. Policy tools during 1985-2012 to be considered include Deficiency Payments (Loan Deficiency Payment/Marketing Loan Gains; hereafter LDP/MLG), Direct Payments

(DP), and Counter-Cyclical Payments (CCP). Despite their important implications, such policies as Average Crop Revenue Election (ACRE), Acreage Reduction Program (ARP), and Conservation and Reserve Program (CRP) are not included in the proposed model. ACRE, introduced by the Farm Act of 2008, is excluded because there are not sufficient observations to evaluate the program's effects and because participation was very low. ARP and CRP do have relevant implications for the purpose of this study because of their impacts on planted acres and yields.[2] Limited data availability across regions and by crop prevents this study from incorporating them into the model.

Each program's conditions lead to modification of the formulation for ENRs. LDP/MLG is in play when market price is lower than the predetermined Loan Rate (LR). CCP can be paid to eligible producers when the 'effective price' (market price + DP) does not exceed Target Price (TP). Plugging the government payments into equation (1) produces a more complete definition of ENRs used in this study, equation (2).

$$
\begin{aligned}
(2)\ ENR_{ikt} = {} & (MP_{ik,\,t-1} * YLE_{ikt}) + (\mathrm{Max}\ (LR_{it} - MP_{i,\,t-1}, 0) * YLE_{ikt}) \\
& + (DPR_{it} * DPY_{it} * DPM_{it}) \\
& + (\mathrm{Max}\ (TP_{it} - DP_{it}) - MP_{i,\,t-1}, 0) * CCPY_{it} * CCPM_{it}) - VC_{ik,\,t-1},
\end{aligned}
$$

where MP = farm price, LR = Loan Rate, DPR = Direct Payment rate, DPY = Direct Payment yield, DPM = Direct Payment multiplier, CCPR = Counter-Cyclical Payment rate, CCPY = Counter-Cyclical Payment yield, CCPM = Counter-Cyclical Payment

2 Because of slippage, proportional decreases in production due to idling lands are likely smaller than planted acre reductions.

multiplier, TP = Target Price; VC = variable production costs, and YLE is expected yields.

In equation (2), the first term equals the expected per-acre revenue of a crop i in region k in a given year t. The second term represents the amount of per-acre compensation under Loan Rate. When market price is higher than the pre-announced Loan Rate, this term equals zero. The third term explains the amounts of Direct Payments that have been in effect since the 2002 Farm Bill. As the Direct Payment is paid to the eligible producers regardless of market conditions, the payments shift the ENRs curve to the right-hand side. The last term accounts for CCP which is triggered only if the 'effective price' is lower than predetermined TP minus the Direct Payment. If the condition is met, the difference between TP minus DP and 'effective price' is multiplied by the predetermined CCP yields and multiplier to obtain the amounts of CCP payments.

One shortcoming regarding the specification comes from the failure of considering payment limits imposed to individual producer or entity. Due to this omission, the amount of policy payments received by producers calculated with equation (2) could be larger than what it would have actually been. To address the problem, the values of ENRs are weighted by 'attenuation' factors based in past payment history.

To incorporate the impact from intra-regional competition between different crops for the finite crop lands, the planted acre equations will include ENRs. This study uses the ratios of ENRs instead of using ENRs themselves. For a certain crop i and its competing crop j, the ratio of ENRs equals ENRs of crop i divided by ENRs of crop j. The adoption of ENRs ratio mitigates the problem resulting from extraordinarily high prices in recent years. Since the mid-2000s, most crops' prices and ENRs have risen drastically whereas their planted acres remained relatively stable. In this sense, using the ratio may allow the changes of ENRs to be more stable. Time trend is included to capture any unobservable influences. It is implausible to believe that producers instantly shift from the current crop mix to another. To accommodate such a time lag, this study depends on the concept of partial adjustment. The partial adjustment procedure suggested by Nerlove (1958) argues that agricultural producers might not be able to respond instantaneously to market signals in the short run. This study will consider adopting the lagged dependent variable as an exogenous variable[3]. Put together, the planted acres (PA) function has the following form:

(3) $PA_{ikt} = PA\ (PA_{ik,\,t-1},\ ENR_{jkt}\ /\ ENR_{ikt},\ Time) + \varepsilon_{ikt},\ \forall\ j \neq i,$

where PA = planted acres, ENR = expected net returns, Time = time trend, ε= error term, and subscripts i, j, k and t represent crop, region, and time.

Once the planted acres function is estimated, harvested acres (HA) can be estimated using equation (3). Time component for the planted acres on the right-hand side can be either a current year or next year depending on planting schedules. It is to be

3 In many regions, substantial fluctuations in planted acres have been found. Thus simply adding a one-period-lag might fail to address the potential partial adjustment procedure. Such a tool as Akaike loss function might be used to capture the optimal lag length.

noted that specific agricultural practices in specific regions, e.g. grazing out wheat in the Southern Plains, needs to be considered.

(4) $HA_{ikt} = HA\ (PA_{ikt}, \text{Specific factors}_{ikt}) + \varepsilon_{ikt}$,

where HA = harvested acres, PA = planted acres, ε= error term, and subscripts i, j, k and t represent crop, region, and time.

This study assumes that crop yields take an expected form. First, each crop's yield is determined by technology to the extent that advanced technologies encourage producers to increase yields. Region or crop-specific factors can be taken into account, e.g., introduction of GMO in soybeans and a marketing quota for peanuts.

(5) $YLE_{ikt} = YLE\ (\text{Time}, \text{Specific factors}_{ikt}) + \varepsilon_{ikt}$,

where YLE = expected yields, Time = time trend, ε= error term, and subscripts i, k, and t represent crop, region, and time.

Regional production or equation (6) can be computed by multiplying equations (4) and (5). Total supply for year t equals to the summation of total production, beginning stocks, and imports as shown in equation (7).

(6) $\text{Production}_{ikt} = HA_{ikt} * YLE_{ikt}$,

(7) $\text{Supply}_{it} = \Sigma\ \text{Production}_{ikt} + \text{Beginning Stocks}_{it}$,

where YLE denotes the realized yields, and the subscripts i, k, and t represent crop, region, and time.

Domestic Demand Estimation

The U.S. crop demand is composed of domestic and export demand, and will be estimated at the national level. According to the U.S. Department of Agriculture (USDA) categorization, domestic demand is broken into sub-categories by crop. Unless stated otherwise, the sub-demand categories are in line with those used by the USDA. This study assumes that the U.S. livestock sector and the supply/demand in the rest of world (ROW) are exogenous.

As equation (8) reflects, seed use mostly depends on the planted acre of the corresponding crops. Changes in the crop prices and/or production costs can be reflected through ENRs changes.

(8) $SEED_{it} = SEED\ (PA_{it}) + \mathcal{E}_{it}$

, where SEED = seed use, PA = planted acres, $\mathcal{E}$ = error term, and the subscripts i and t represent crop and time.

The feed demand equation includes feed grain prices, price of substitutes, the number of grain-consuming animal units, time, and specific factors. The specification is guided by Arzac and Wilkinson (1979) and Dillon and Anderson (1990). The crop's own price and cross prices are included to reflect the law of demand and competition.

The number of animal units serves as a demand shifter. Time trend and specific factors may explain any variations not captured by the other components.

(9) $FEED_{it}$ = FEED (FGP_{it}, FGP_{jt}, $GCAU_t$, Time, Specific Factors $_{it}$) + $\mathcal{E}_{it}$,

where FEED = feed demand, FGP = feed grain price, GCAU = the animal units on feed, Time = time trend, $\mathcal{E}$ = error term, and the subscripts i, j and t represent crop and time.

The food demand equation consists of the crop's own price and cross prices, per capita Food and Beverage (F&B) expenditures, trend, and specific factors. The crop's own and cross prices are included to reflect the law of demand and competition. Per capita expenditures are serving as a demand shifter. Time trend and specific factors may explain any variations not captured by the other components.

(10) $FOOD_{it}$ = FOOD (FGP_{it}, FGP_{jt}, $FBEX_t$, Time, Specific Factors $_{it}$) + $\mathcal{E}_{it}$,

where FOOD = food demand, FGP = grain price, FBEX = per capita F&B expenditures, Time = time trend, $\mathcal{E}$ = error term, and the subscripts i, j and t represent crop and time.

The energy demand equation, applied to corn and soybean oil, is composed of output (ethanol or biodiesel) price, petroleum price, number of vehicles, time, and specific factors.[4] The crop's own and cross prices are included to reflect the law of demand and competition. The number of fleets and petroleum price are serves as demand shifters. Time trend and specific factors added to capture the increase in biofuel production over time (Fortenbery and Park 2008).

(11) $BEBD_{it} = BEBD\ (OPP_{it}, OIL_t, MV_t, Time, Specific\ Factors_t) + \varepsilon_{it}$,

where BEBD = biofuel demand, OPP = biofuel price, OIL = crude oil price, MV = the number of flex-fuel vehicles, Time = time trend, ε = error term, and the subscripts i and t represent crop and time.

The export demand equations basically include the crop's own and cross price, agricultural trade-weighted real exchange rate, trend, and/or lagged dependent variable (last year's exports). The crop's own and cross prices are included to reflect the law of demand and competition. The exchange rate is used to capture the demand by the rest of world. Time trend and specific factors may explain any variations not captured by the other components.[5]

(12) $EX_{it} = EX\ (FGP_{it}, FGP_{jt}, USREER_t, Time, Specific\ Factors_t) + \varepsilon_{it},\ \forall\ j \neq i$,

[4] The crude oil price is specified as a determinant of biofuel demand in Equation (11). However, as a fixed portion of biofuel is mixed into gasoline, the oil price might also affect biofuel price via the demand change for the oil demand.

[5] Some previous studies argue that setting quantity exported instead of price as a dependent variable, i.e. employing inverse demand function, in the structural model can produce different results (Babula, Ruppel, and Bessler 1995; Bessler and Babula 1987).

where EX = export demand, FGP = crop price, USREER = agricultural trade-weighted real exchange rate, Time = time trend, ε = error term, and the subscripts i, j and t represent crop and time.

Dynamics, Market Equilibrium, and Regional Price Adjustments

The proposed economic analysis model has recursive dynamic attributes. That is, the solved market-clearing prices and quantities in a given year become exogenous variables and affect decision making in the following years. In solving the system of equations, it is the elasticities of supply response that are assumed to be constant over time but vary across regions.

The proposed economic analysis model calculates each commodity's equilibrium price by minimizing the 'objective' function. The objective function equals a squared sum of each commodity's excess supply in a given year. Minimizing the objective function enables the entire system to be as close to the simultaneous market-clearing status as possible. A squared sum is used to avoid any potential offset between excess supply and demand. Suppose that there is an excess supply for a crop and an excess demand for the same amount of another in a given year. Even though the market-clearing condition is not actually satisfied, summing up excess supply and demand in these two commodity markets would make it look as if the clearing has happened..

The national equilibrium price needs to be adjusted to the regional prices to reflect different price variations and producers' responses across regions. As producers are expected to make their planting decision based on the specific market signal, they perceive, it makes more sense to conclude that the planting decision will be based on the regional crop price rather than the national average price.

Economic Impact Analysis

Equations (7) - (12) can be used to obtain *status quo* partial market equilibria, referred to as the baseline. The baseline results are reference points to be compared with results under the changes in policy shifters. Changes in the exchange rate and the RFS2 are expected to exert their influences through crop demand whereas budget reductions are expected to exert their influences on ENRs and supply. The appreciation of the U.S. dollar is likely to shrink import demand from the U.S. trading partners. Because the U.S. agricultural exports have absorbed a substantial portion of domestic production, reduced exports would cause the domestic prices to fall (Goldstein 1989; Mitra and Josling 2009). Consequently, the lowered ENRs might differentially impact the economics of crops based on their dependence on exports.

In any single crop market, a stronger U.S. dollar is expected to decrease the crop's export demand when other things remain unchanged. Likewise, the depreciation of the U.S. dollar is expected to increase the demand. Effects of the exchange rate changes on total demand may vary by crop. The interactions between crops sectors can affect magnitudes of effects caused by the exchange rate changes. For the analytical sake, the U.S. is assumed to be a large exporter, implying that the changes of the U.S. currency have direct effects on the global market.

The depreciation of the U.S. dollar will rotate the excess demand for the commodity by the rest of world (ROW) to the right-hand side, as is described in the right panel of figure B-1. The expected price changes under the depreciation are likely to affect both producers and consumers. The increased excess demand is expected to increase the U.S. domestic production (from Q_3 to Q_4) and decrease the domestic demand (from Q_2 to Q_1). In the U.S., areas A and B represent the reduction in consumer surplus due to the price changes. Areas A, B, and C account for producers gains due to the depreciation. Area D serves to explain the increasing costs for the producers due to input price changes. Generally speaking, the producer surplus can exceed the consumer surplus under the depreciation.

Appreciation of the U.S. dollar is expected to affect the U.S. crop sector in a similar way, but toward opposite direction. The overvaluation of U.S. currency is expected to rotate the excess demand for the commodity by the rest of world (ROW) to the left-hand side, as is described in the right panel of figure B-2. The decreased excess demand is expected to decrease the U.S. domestic production (from Q_8 to Q_7) and increase the domestic demand (from Q_9 to Q_{10}). In the U.S., areas E and F represent the additional benefit the consumer is expected to have due to the price changes. Areas E, F, and G account for producer's loss or decreasing producer surplus due to the appreciation. Area H explains the decreasing costs for the producers due to input price changes.

Without considering such programs as import tariff or quota, little benefits or losses are expected for the government. The price changes resulting from the exchange rate changes can potentially affect the government expenditure. The expectedly lower prices under the appreciation might trigger certain program provisions, e.g., counter cyclical payments, which would not have been in effect otherwise. The higher prices expected under the depreciation have potential to save the government budgets.

The RFS2 may change demands for corn and soybeans via mandatory use requirements. The regulation would work to change the major crop prices and, in turn, the planted acres as producers would switch to more profitable crops. The supply responses related with corn and soybean sectors could have large impacts on the planted acres and prices of other crops.

The RFS2 is expected to affect both biofuel and input markets via the mandatory use level. If the mandatory use level is smaller than the forecasted demand under the baseline, implementation of the RFS2 will have negligible impacts on the markets.

In contrast, the mandates exceeding the forecasted demand will substantially affect the markets because the mandatory quantity is required to be consumed regardless of the market prices. As a result, more biofuels should be produced to meet the minimum requirements, which increases the quantity of inputs used to produce ethanol or biodiesel. In addition, the expected higher biofuel prices will improve the operating margins for ethanol and biodiesel (figures B-3 and B-4). The higher operating margins are expected to increase the demand for inputs. Consequently, the increased demands for energy crops are expected to cause the crop prices to be higher than under the baseline or in the absence of the RFS2.

The effects resulting from the RFS2 are expected to vary for relevant participants. Given that the corn and soybean prices are higher due to the RFS2, the crop producers are expected to benefit from the changes via higher ENRs. If the planted acres of corn and/or soybean are reduced for some reason, the expected increments for total producer surplus might be mitigated or even reduced. As higher ENRs are supposed to induce the producers to allocate more lands for the profitable crops, implementation of the RFS2 is expected to increase the total producer surplus. Expansion of corn and soybean planted acres is expected to be achieved at the expense of the planted acres for other crops to some degree. It follows that the reduced planted acres will decrease production and increase the prices. The higher prices are beneficial for the crop producers whereas the smaller planted acres will reduce the total revenue, so the changes in total producer surplus for other crops needs to be empirically evaluated.

The RFS2 is expected to reduce the consumer surplus for both livestock producers and final consumers (Johansson and Azar 2007; Banerjee 2011). As the RFS2 is expected to cause the prices of feed grains to change, the U.S. livestock producers are likely to face higher input costs. When the higher costs deteriorate the profitability, the livestock growers are expected to respond to the changes by reducing the size of herds. Due to the growing cycle or biological lags, the respond is expected to be realized in later years. As the proposed model in this study treats the livestock sector as exogenous, it may not successfully capture the responses from the sector. The higher prices are expected to reduce the consumer surplus for those who demand corn and soybeans for food consumption. The RFS2 is arguably expected to improve the biofuel processors' profitability. The higher biofuel prices and guaranteed minimum volumes resulting from the RFS2 are supposed to increase the operating margins. The higher input costs due to the higher prices of corn and soybeans may offset the additional benefits. As discussed by Kesan, Ohyama, and Yang (2009), improved competition between biofuel firms can possibly affect the profitability.

In the U.S. ethanol market, areas e and f represent the additional benefit the ethanol blender is expected to have due to the price changes. Areas e, f, and g account for consumers' loss or decreasing consumer surplus due to the RFS2. In the corn market, areas a, b, and c are equal to the increased producer surplus meanwhile areas a, b, and d account for the reduction in consumer surplus (figure B-3).

In the U.S. biodiesel market, areas p and q represent the additional benefit the biodiesel blender is expected to have due to the price changes. Areas p, q, and r account for consumers' loss or decreasing consumer surplus due to the RFS2. In the soybean oil market, areas l, m, and n are equal to the increased producer surplus meanwhile areas l, m, and o account for the reduction on consumer surplus. For the soybean market, areas h, i, and j are equal to the increased producer surplus meanwhile areas h, i, and k account for the reduction in consumer surplus (figure B-4).

The government expenditures related to the biofuel policies are expected to depend on the expiration of 'direct' approach such as tax exemption and import tariffs rather than the 'indirect' approach including the RFS2 (Gorter and Just 2009). From the standpoint of the government, elimination of Volumetric Ethanol Excise Tax Credit (VEETC) can contribute to reducing the government expenditure[6]. Eliminating VEETC

6 The VEETC is estimated to cost the U.S. taxpayers $5.7 billion annually. The cumulative amounts are estimated to be $24.0 billion during 2005-2010 (U.S. GAO 2011).

and only implementing the RFS2 are expected to lower the prices of biofuels and food, which benefits consumers at the cost of surplus for the crop and fuel producers (Chen and Khanna 2012).

A brief introduction is to be desired regarding the effects of the RFS2 on other important sectors not analyzed in this study. First, the RFS2 is expected to cause the ethanol price to be higher as discussed earlier. The degree of price changes may largely depend on the crude oil prices which are assumed to be exogenous in this study. In the diesel market, the mandates for biodiesel may have smaller effects on the diesel market because biodiesel accounts for a tiny share in total diesel consumption (EIA). Second, the RFS2 implementation is expected to mitigate the dependence on fossil fuels and contribute to reduce greenhouse gas (GHG) emission. The EISA required that the lifecycle GHG emission from biofuels should satisfy the threshold reduction which ranged between 20~60% by fuel types (Schnepf 2013). Implementation of the RFS2 is expected to reduce the GHG emissions compared to the absence of the regulation. According to the EPA (2010), the forecasted annualized emission reduction equals 138.4 million metric tons of CO_2-equivalent emissions.

A reduction on U.S. farm program supports will result in lower ENRs of major crops, but its impacts will vary across regions and by crop. For example, rice and cotton growers might experience more severe shocks than corn producers due to their greater dependency on DP/CCP and relatively fewer substitutes. As a result, eliminating farm program payments might disproportionally shift total supply for some crops to the left-hand side across regions.

As the 2014 Farm Bill determined to repeal DP and CCP, the decrements for farm incomes are inevitable. Such alternative programs as Price Loss Coverage (PLC) and Agricultural Risk Coverage (ARC) have different triggering conditions, thus their impacts are expected to differ in terms of compensating the expected income reduction.

Lower ENRs resulting from the elimination of DP and CCP will induce producers to allocate less resource for the crop. The heavier the dependence on the program payments, the larger the changes of ENRs will be. The changes in planting decisions will work to reduce the crop's production in the next year. The change mentioned above can be applied to any single crop. However, intra-region competition between crops and the effects of alternative programs should be considered. The inter-crop competition implies that planted acres of a crop can increase in spite of lower ENRs, if there are larger decrements of ENRs for competing crop(s). The degree to which the alternative programs can mitigate the effects of eliminating DP and CCP can vary by crop and across regions.

The changes in market equilibrium prices and planted acres for each crop will be subject to a number of variations. The theoretically expected impacts of the 2014 Farm Bill on the U.S. crop sector may not be clearly anticipated (figure B-5).

This study will validate the model to verify if parameter estimates are consistent with economic theory, if empirical analysis results are consistent with the expected changes and if the magnitude of changes makes sense. This study will provide the long-term forecast of impacts for the policy shifters on the U.S. crop sector. The results would provide useful information for policy makers.

Measurements of Changes in Welfare and Policy Implications

In attempts to approximate the welfare changes under the external shocks, this study adopts some assumptions. First, the welfare measurement is confined to the U.S. domestic side. The welfare changes for consumers resulting from the changes in export demand will be transferred to those in the rest of world (ROW). The welfare changes in importing countries will not be directly relevant to the U.S. consumers' surplus. As the proposed model in this study assumes the ROW as an exogenous variable, it has a limitation in measuring the welfare changes in other countries. Second, beginning stocks and imports are not included when measuring the producer surplus (PS) changes. Measuring the consumer surplus (CS) does not contain the export demand and ending stocks. Based on the assumptions, the producer and consumer changes under the external shocks are compared to those under the baseline. More detailed welfare measurements resulting from the external shocks will be provided through Chapter VI and Chapter VIII.

CHAPTER IV

SUPPLY AND DEMAND ESTIMATION

Corn

Background

Corn is the most widely produced feed crop in the U.S. whose planted acres reached 91.9 and 97 million acres in 2011 and 2012, (USDA NASS 2013). The U.S. total corn planted acres have generally increased since the mid-1980s with some fluctuations. The U.S. corn production has increased over time and sharply shifted up since 2002. The post-2002 changes have come true at the cost of other crop's planted acres reduction such as soybean, wheat, and barley (USDA NASS 2013).

Corn is the largest component of U.S. feed grains and has been mainly used for feed (USDA ERS 2013). The recent biofuel boom has rapidly increased the quantity of corn used to produce ethanol (US EIA 2013).

The U.S. corn price had been stable during 1985-2005 (average equals to $2.23 per bushel, S.D equals to $0.37). Subsequently, the corn price rose much higher and become more volatile (average equals to $4.74 per bushel, S.D equals to $1.43). The U.S corn price reached the record-high level of $6.20 and $6.95 per bushel in 2011 and 2012. A recent biofuels boom, spurred by the introduction of the renewable energy policy, has contributed to the rise in corn price.

Regional Planted Acres, Harvested Acres, Expected Yields, and Production Estimation

The U.S. corn planted acres and production have been highly concentrated in the Corn Belt, Central Plains, and Lake States. The Corn Belt is the single largest production region accounting for, on average, 45.0% and 50.7% of total corn planted acres and production during 1985-2012. When including the Lake States and Central Plains, the share of these regions goes up to, on average, 77.1% and 83.4% for total planted acres and production (figure B-6).

Corn Belt

The Corn Belt historically has been a predominant production region of corn, accounting for about half of total planted acres (45.0%) and production (50.7%) during 1985-2012, on average. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Corn Belt is high. In this region, corn planted acres tend to moderately expand over time.

The estimation results are summarized in table C-3.[7] A main competitor with corn in the Corn Belt is soybeans because of overlapping planting and harvesting schedule. Corn and soybean's planting and harvesting are most actively made in May-June and September-October (USDA 2010). A negative sign of corn-soybeans ENRs ratio supports the competition between the crops. The coefficient is statistically

[7] Note that descriptions of each variable are presented in Table A-1.

significant at the 1% level. According to expected corn yields estimation, corn yields in the Corn Belt tend to increase by 1.83 bushels per acre annually. Time trend and dummy variables are added to capture the unobservable effects including severe drought in 2012.

Central Plains

The Central Plains historically has been one of the largest corn production regions next to the Corn Belt and Lake States, accounting for 15.4% of total corn planted acres during 1985-2012. The explanatory power for next year's planted acres, harvested acres in the Central Plains is very high. In this region, corn planted acres had tended to be stable until the mid-2000s. Since 2006, the planted acres have rapidly increased by 3.5 million acres over the 7 consecutive years.

The estimation results are summarized in table C-4. The sign for corn-soybeans ENRs ratio is in line with theoretical expectations. Compared to other regions, the degree of competition between corn and soybeans appears to be relatively less sensitive. According to expected corn yield estimation, corn yields in the Central Plains tend to increase by 0.95 bushel per acre annually. Time trend and dummy variables are added to capture the unobservable effects.

Delta States

In terms of share in total corn planted acres and production, the Delta States has play a tiny role, occupying about 1.35% and 1.33% during 1985-2012. The explanatory power for next year's planted and harvested acres in the Delta States is high.

The estimation results are summarized in table C-5. In this minor corn production region, corn planted acres tend to increase over time. The sign for corn-soybeans ENRs ratio appears as expected, and is statistically significant at the 10% level. Compared to other regions, the degree of competition between corn and soybean appears to be less sensitive. According to expected corn yields estimation, corn yields in the Delta States tend to increase by 2.13 bushels per acre annually. Time trend and dummy variables are added to capture the unobservable effects.

Far West

In terms of share in total corn planted acres and production, the Far West has played a minor role like the Delta States. On average, the Far West has accounted for 1.35% of total planted acres and 0.71% of total production during 1985-2012. The explanatory power for next year's planted acres and expected yields in the Far West is high.

The estimation results are summarized in table C-6. In this minor corn-producing region, a large portion of planted acres has been abandoned. Moreover, the regional harvested portion has decreased over time from 44.9% in the 1990s to 33.5% in the 2000s, on average. In the Far West, spring barley mainly competes with corn because of overlapping planting-harvesting schedule. They are most actively planted and harvested in May and August-September (USDA 2010). The sign for corn-barley ENRs ratio appears as expected, but is not statistically significant. According to expected corn yield estimation, corn yields in the Far West tend to increase, on average, by 1.40 bushels per acre annually. Time trend and dummy variables are added to capture the unobservable effects.

Lake States

Historically, the Lake States has been the second largest corn production region next only to the Corn Belt. The estimation results are summarized in table C-7. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Lake State is high. Corn planted acres in the Lake States tend to increase over time. The sign corn-soybeans ENRs ratio is as expected and statistically significant at the 5% level. According to expected corn yield estimation, corn yields in the Lake States tend to increase by 1.85 bushels per acre annually. Time trend and dummy variables are added to capture the unobservable effects.

North East

The North East has been a minor region in terms of crop production. Corn is no exception in that, on average, this region accounts for only 4.5% and 2.6% of total corn planted acres and production during 1985-2012. A high fluctuation in the corn planted acres in the North East limits explanatory power of estimation. During 1985-1988, there was a sharp decrease in corn planted acres from 4.6 million acres to 3.6 million acres. A continuous reduction of corn planted acres in this region had continued during 1997-2006. Since 2007, an extraordinarily high corn price has expanded corn planted acres

(3.26 million acres in 2006 and 3.74 million acres in 2012).

The estimation results are summarized in table C-8. The explanatory power for next year's planted acres, harvested acres, and expected yields in the North East appears fair. The sign for corn-soybeans ENRs ratio appears as expected, but is not statistically significant. A harvested acres estimation result shows that, on average, only 68.1% of planted acres are harvested. According to expected corn yields estimation, average corn yields in the North East tend to increase by 1.26 bushels per acre annually. Time trend and dummy variables are added to capture the unobservable effects.

Northern Plains

The Northern Plains, a major wheat production region, has accounted for a small portion for corn planted acres and production. This region, on average, accounts for 7.0% and 5.1% of total corn planted acres and production during 1985-2012. Corn planted acres in the Northern Plains tend to decrease over time. Since 2007, exceptionally high corn prices led corn planted acres to largely expand to reach 7.6 million acres in 2011, increasing by 20.1% compared to 2006.

The estimation results are summarized in table C-9. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Northern Plains is high. The sign for corn-soybeans ENRs ratio in this region appears as expected, but is not statistically significant. A harvested acres estimation result shows that most of planted acres have been harvested. According to expected corn yields estimation, average corn yields in the Northern Plains tend to increase by 2.24 bushels per acre annually. Time trend and dummy variables are added to capture the unobservable effects.

South East

The South East has accounted for, on average, 6.0% and 4.4% of total corn planted acres and production during 1985-2012. After experiencing a sharp reduction from 7.5 million acres in 1985 to 4.9 million acres in 1988, the corn planted acres in the South East had moderately decreased until 2006. Following a sharp expansion in 2007 (5.25 million acres, increasing by 38.5% compared to 2006), the regional corn planted acres have gradually been larger.

The estimation results are summarized in table C-10. The explanatory power for next year's harvested acres and expected yields in the South East is fair. A drastic change in the mid-1980s limits the goodness-of-fit of the model. The sign for corn-soybeans ENRs ratio underpins their competition, but is not statistically significant. The harvested acres estimation result shows that, on average, about 83% of planted acres are harvested. According to expected corn yields estimation, corn yields in the South East tend to increase by 1.27 bushels per acre annually. Time trend and dummy variables are added to capture the unobservable effects.

Southern Plains

In the Southern Plains, corn has not been a dominant crop, accounting for, on average, 2.8% and 2.4% of total corn planted acres and production during 1985-2012,.

Prior to 1994, corn planted acres had increased, followed by fluctuations over the next decade. Higher corn price in the late 2000s led the corn planted acres to increase during 2007-2009 averaging 2.76 million acres. The acres had decreased from 2.81 million acres in 2010 to 2.34 million acres in 2012.

The estimation results are summarized in table C-11. The explanatory power for next year's harvested acres and expected yields in the Southern Plains is fair. A main competitor with corn in this region is sorghum because of overlapping planting-harvesting schedule. In the Southern Plains, corn and sorghum's planting and harvesting are most actively done in March-June and July-November (USDA 2010). The sign for corn-sorghum ENRs ratio in Southern Plains appears as expected, and is statistically significant at the 10% level. A harvested acres estimation result shows that, on average, about 72.7% planted acres are harvested. According to expected corn yields estimation, corn yields in Southern Plains tend to increase by 0.85 bushel per acre annually, substantially lower than those in other regions. Time trend and dummy variables are added to capture the unobservable effects.

By multiplying each region's harvested acres with its corresponding expected yields, regional corn production can be estimated. Summing up all of the regions' production equals to the total quantity of corn produced in a given year. Adding the beginning stocks and quantity imported enables the total supply to be calculated.

Corn Demand Estimation

Seed Use Estimation

A major determinant of corn seed use is corn planted acres in the coming year. In most regions, corn is planted in March - May and harvested during August - early October (USDA 2010). Out of this planting-harvesting schedule, it may be inferred that corn seed use in a given year (t) may heavily depend on the expected size of planted acres in the following year (t+1). In this sense, the corn seed use equation describes the quantity demanded in time t as a function of expected magnitudes of planted acres in time (t+1).

The estimation results are summarized in table C-12. An estimate for this relationship shows that of corn planted acres in coming year account for most of corn seed use (adj. R^2 = 0.998) and that 1% increment in planted acres in coming year is accompanied by almost identical increase (0.99%) for corn seed use, on average.

Feed Demand Estimation

Corn is the single most important livestock feed ingredient in the U.S., accounting for 95.3% of domestic feed grain production in 2012 (USDA WASDE 2012). Economic theory suggests that quantity demanded for corn feed use may be influenced by own price, substitutes' prices, and other supply and demand shifters. A corn feed demand equation incorporates corn farm price, soybean meal price, number of grain-consuming animal units, and corn production in the current year.

The estimation results are summarized in table C-13. Estimation results indicate that these variables explain the quantity demanded for corn feed use fairly well (adj. R^2 = 0.852). All of the signs are consistent with theoretical expectations. Corn feed demand elasticities are less than unity in the absolute term (-0.329~0.076) with an exception of grain-consuming animal units (1.532).

When adding gluten meal prices as an explanatory variable, the variable has a negative coefficient. It may come from the fact that it is a byproduct of corn and thus, its price is closely correlated with corn price. (A correlation coefficient between average real corn price and real gluten meal price is 0.78 and statistically significant at the 1% level. The value of variation inflation factor indicates the presence of multicollinearity.) Adding other substitutes' (sorghum and barley) price fails to improve the estimation results and none of them are statistically significant.

Food and Industrial Demand Estimation

In this study, Food, Alcohol, and Industrial (FAI) demand category used by the USDA is divided into two sub-categories; food and industrial demand and ethanol demand. Corn food and industrial demand is a summation of the use for high fructose corn syrup (HFCS), glucose and dextrose, cornstarch, beverages and manufacturing, and cereal and others. The quantity of corn demanded for alcohol (ethanol) use depends on ethanol production.

The estimation results are summarized in table C-14. A corn processing demand equation includes corn farm price and trend. Trend is included to capture unobserved changes. This equation fairly well explains variations for in corn processing demand.

All of the coefficients are in line with theoretic expectation and statistically significant at the 1% level.

Ethanol Demand Estimation

Corn demand for ethanol production is calculated based on the following assumptions: (1) the share of wet milling decreased from 90% in 1985 to 10% in 2012 whereas that of dry milling increased 10% in 1985 to 90% in 2012; (2) wet and dry milling can produce 2.65 and 2.75 gallons of ethanol from 1 bushel of corn; and (3) 95% of total ethanol production comes from corn. More detailed assumptions, formulas, and estimation results are provided in the Ethanol section in this chapter.

Export Demand Estimation

The U.S. has been a leading exporter in the world corn market. This country's share in total corn trade has been larger than, on average, 60% over the last two decades (USDA FAS 2013). Based on research by Collins et al (1980) and Chambers (1981), the export demand equation consists of own price, substitutes' prices, and agricultural trade-weighted exchange rates. Dummy variables are included to account for changes not captured by the variables mentioned above.

The estimation results are summarized in table C-15. Estimation results indicate that these variables fairly explain the quantity demanded for corn feed use. All of the signs are consistent with theoretical expectations. In terms of elasticity, corn export demand is more sensitive to own price (-1.543) than cross price (0.755 for wheat and

0.711 for sorghum) and exchange rate (-0.615).

Summing up all of the quantities demanded by each sub-category and ending stocks equals the total corn quantity demanded in a given year.

Adjusting National Equilibrium Price to Regional Prices

Regional corn prices are estimated as a function of the national average equilibrium price. The estimation results are summarized in table C-16. Estimation results show that the national equilibrium price of corn almost perfectly accounts for regional corn prices. The absolute values of price variation marginally lie within 10% of the equilibrium price.

Barley

Background

Barley is widely cultivated in the U.S. except for mid-regions because of its insensitivity to climate conditions. The U.S. barley total acres have been decreasing from 13.1 million acres in 1985 to the record-low level of 2.56 million acres in 2010. Total planted acres of barley rebounded to 3.64 million acres in 2011 and remained stable at 3.49 million acres in 2012 (USDA NASS 2013).

Barley prices during 1985-1996 tend to moderately rise with two spikes in 1988 and 1995. From 2007 through 2009, crop prices generally became higher and barley price was no exception. The 2007-2009 U.S. barley average prices were higher than the preceding 3 years' average prices by 78.6%. In 2010, barley price fell to $3.86 per bushel, but again rose to $5.35 and $6.40 per bushel in the following two years.

Supply Estimation

Regional Planted Acres, Harvested Acres, Expected Yields, and Production Estimation

Northern Plains and Far West are the two largest barley production regions accounting for on average, 58.3% and 25.1% of total planted acres during 1985-2012 (figure B-12). In the major production regions, fall barley competes with winter wheat, and spring barley with corn.

Far West

The Far West historically has been the second largest barley production region, accounting for, on average, 25.1% of total planted acres and 26.1 % of total production during 1985-2012 (USDA NASS 2013). The explanatory power for next year's planted acres, harvested acres, and expected yields in the Far West is high. In this region, barley planted acres tend to rapidly decline over time. When estimating barley planted acres in the Far West, the lagged endogenous variable or the previous year's barley planted acres are used. It works to reflect declining trend and prevents the forecasted planted acres from having negative values.

The estimation results are summarized in table C-17. A main competitor with barley in this region is winter wheat due to overlapping planting schedule. In the Far

West, barley and wheat’s planting and harvesting are most actively made in September-October and October-November (USDA 2010). However, the effects of barley-wheat ENRs ratio on barley planted acres are statistically insignificant. Expected barley yields estimation indicates that barley yields in the Far West tend to increase by 0.79 bushel per acre annually.

Northern Plains

The Northern Plains has been the largest production region of barley, accounting for, on average, 57.5% of total planted acres and 57.4 % of total production during 1985-2012. North Dakota and Montana are the largest production states (USDA NASS 2013).

The explanatory power for next year’s planted acres, harvested acres, and expected yields in Northern Plains is reasonable. In this region, barley planted acres tend to moderately decline over time, compared to those in the Far West. When estimating barley planted acres in the Northern Plains, the lagged endogenous variable or the previous year’s barley planted acres are used. It works to reflect declining trend and prevents the forecasted planted acres from having negative values.

The estimation results are summarized in table C-18. A main competitor with barley in this region is corn because of overlapping planting season. However, the effects of barley-corn ENRs ratio on barley planted acres are statistically insignificant. Expected barley yields estimation indicates that barley yields in the Northern Plains tend to increase by 0.55 bushel per acre annually. Annual dummies for 1988 and 1985 are used to capture unusually lower yields.

By multiplying each region's harvested acres with the corresponding expected yields, regional barley production can be estimated. Summing up all of the regions' production equals the total quantity of barley produced in a given year. Adding the beginning stocks and quantity imported leads to the total supply.

Unlike other major crops such as corn and soybeans, estimation of the U.S. total barley planted acres requires 'other' regions' planted acres. The major production regions of interest, Far West and Northern Plains, account for 82.6% of total planted acres during 1985-2012. This share might have a problem of under-estimating the total U.S. barley planted acres. All other regions' barley planted acres are assumed to follow past 5-years' moving average in the forecasting period. This step is applied to 'other' regions' barley production in the same manner.

Barley Demand Estimation

Seed Use Estimation

A major determinant of barley seed use is barley planted acres in the following year. In most regions, fall and spring barley is planted in September – October and March – April (USDA 2010). Out of this planting-harvesting schedule, it may be inferred that barley seed use in a given year (t) may have been heavily dependent on the expected size of planted acres in the following year (t+1). In this sense, the barley seed use equation describes the quantity demanded in time t as a function of expected magnitudes of planted acres in time (t+1).

The estimation results are summarized in table C-19. The estimate for this relationship shows that barley planted acres in the coming year account for most of the seed use and that 1% increment in planted acres in the coming year is accompanied by almost an identical increase (0.94%) in barley seed use, on average.

Feed Demand Estimation

As feed grains, barley competes with corn and is mainly fed to dairy units (Agricultural Marketing Resource Center (AGMRC) 2014). A higher barley price will reduce barley feed demand when other things are equal. Likewise, higher prices of competing feed crops will induce the diary industry to consume more barley. As barley imports share is tiny out of total barley supply, domestic production plays an important role in determining the availability of feed barley.

The estimation results are summarized in table C-20. Estimation results show that the variables mentioned above reasonably explain changes in U.S. barley feed demand. The response of barley feed demand to feed grain prices corresponds to theoretic expectation and is marginally significant at the 10% level. Barley feed demand elasticities with respect to barley and corn prices are -0.468 and 0.316. The effects of grain-consuming dairy units and domestic barley production have expected signs. Especially, demand elasticity with respect to barley production (1.336) shows that barley feed demand may be sensitive to domestic production.

Food Demand Estimation

For human consumption, wheat and grain sorghum are main competitors with barley (Taylor, Boland, and Brester 2005). That is, barley food demand is expected to decrease if barley price goes up, when other things are equal. Also, a higher price of substitutes will lead barley food demand to increase. Given that barley is a normal good for food usage, consumers' income increment will lead to consumption of a larger quantity of barley. Time trend is included to capture the decreasing food demand for barley over time.

The estimation results are summarized in table C-21. Estimation results show that variables mentioned above decently explains the changes in U.S. barley food demand. The response of barley food demand to corn price corresponds to theoretic expectation and is marginally significant at the 1% level. The response with respect to sorghum price changes indicates that barley and sorghum might be complements rather than substitutes. Barley food demand is relatively inelastic with respect to the ratio of barley and other crop prices (barley-corn price ratio equals to 0.388 and barley-sorghum price ratio equals to -0.337. The sign of the per capita food and beverage expenditure coefficient is as expected and statistically significant at the 1% level. Annual dummies used to explain fluctuations in barley food demand are all statistically significant at the 5% level.

Export Demand Estimation

The U.S. has played a minor role in international barley trade. This country's share in world barley exports and imports during 1985-2012 is 6.02% and 3.04%, (USDA FAS 2013). During 2008-2012, the trade share has been further reduced to 1.04% (exports) and 2.29% (imports). This small trade magnitude might hinder the actual competition between and other feed grains for major importing markets to be clarified. Barley exports estimation does not include other feed grain prices. The estimation fairly well explained the changes in barley export demand.

The estimation results are summarized in table C-22. All of the signs are in line with theoretical expectations and mostly statistically significant at the 10% level. A higher barley price and the appreciation reduce the quantity exported, and the barley export demand elasticity is larger with respect to exchange rate (-1.570) than own price (-0.565). The U.S. barely export demand elasticity with respect to domestic barley production (1.532) indicates that exports' sensitive dependence on domestic availability.

Summing all of the quantities demanded by each of sub-category and ending stocks wields the total barley quantity demanded in a given year.

Adjusting National Equilibrium Price to Regional Prices

Regional barley prices are estimated as a function of the national average equilibrium price. The estimation results are summarized in table C-23. Estimation results show that the national equilibrium price of barley almost perfectly accounts for regional barley prices. A regional price variation is observed such that barley prices in the Far West and the Northern Plains tend to be lower and higher than national average price.

Cotton

Background

Cotton is the most widely used input for the textile industry. The U.S. has been one of the largest cotton producers and exporters in the world, accounting for 17.5% of total production and 29.5% of total exports during 1985-2012 (USDA NASS 2013; USDA FAS 2013). The U.S. cotton industry has experienced a drastic change in the last decade. On the production side, this country's cotton production dropped considerably from 23.9 million bales in 2005 to 12.2 million 480 bales in 2009. In spite of the following increment in consecutive years, the production level remained at 17.3 million 480 bales in 2012. During the same period, the cotton share of the U.S. in the global market was reduced from 20.5% in 2005 to 11.9% in 2009. In the U.S., upland cotton is most widely cultivated, accounting for 98.2% of total cotton planted acres during 1985-2012, on average. A small portion of cotton planting areas is allocated to extra long staple (ELS) cotton, which is planted in Arizona, California, New Mexico, and Texas (USDA ERS 2014). Throughout this dissertation, 'cotton' means upland cotton unless otherwise mentioned.

A couple of noticeable changes were made on the cotton demand side. First, the U.S. domestic cotton demand has drastically decreased over the last two decades, from 11.2 million bales in 1994 to 3.7 million bales in 2012. Second, contrary to the domestic trend, the U.S. has exported more of cotton to the rest of world. Between 1994 and 2010, U.S. cotton exports increased from 9.4 million bales to 14.4 million bales. The structural changes can be attributed to rising world cotton demand, introduction of new technology, and global economic growth (Meyer 2007).

The U.S. cotton price has experienced severe fluctuations. Cotton price dropped from 75.4 cents per pound in 1995 to 29.8 cents per pound in 2001. Consecutive years' rebound raised the price to 61.8 cents per pound in 2003. Going through the rising-price period in the mid- and late-2000s, cotton price increased to 88.3 cents per pound in 2011.

Supply Estimation

Regional Planted Acres, Harvested Acres, Expected Yields, and Production Estimation

In the U.S., the Southern Plains is the single largest production region of upland cotton. This region accounts for, on average, 47.2% of total cotton planted acres and 32.2% of total production during 1985-2012 (figure B-13). A relatively smaller portion of regional production compared to that of planted acres is due to lower average yields.

Delta States

The Delta States has been the third largest cotton production region next to the Southern Plains and South East. On average, this region's planted acre share averaged 19.6% over 1985-2012. However, in the recent 7 years, the Delta States' cotton planted acres and share have declined from 2.9 million acres and 20.3% to 1.3 million acres and 10.6%.

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Delta States is high. All of the explanatory variables are statistically significant at the 5% level except for D94. When estimating cotton planted acres in the Delta States, lagged endogenous variable or previous year's planted acres are used. This variable was used because a trend variable has limits in consistently capturing the regional cotton planted acres' changes due to the 'higher risk' mentioned above.

The estimation results are summarized in table C-24. A main competitor in this region is soybeans. A unit increment in soybean ENRs relative to cotton ENRs reduces the coming year's cotton planted acres by 0.05%, implying that cotton planted acres are substantially inelastic with respect to other crops' profit conditions. Expected yields estimation indicates that average cotton yields in the Delta States tend to increase by 9.5 pounds per acre annually. Annual dummies for 1993, 1995, 2000 and 2009 are used to capture unusually low yields.

Far West

The Far West has been a main producer of ELS cotton and had a minor role in upland cotton production. On average, this region's planted acre share was 7.7% over 1985-2012. The Far West's cotton planted acre share has been below 5% in recent years.

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Far West is high. All of the explanatory variables are statistically significant at the 5% level except for D87. When estimating cotton planted acres in the

Far West, the lagged endogenous variable or previous year's cotton planted acres are used. This variable replaces a trend variable which has limits in consistently capturing the regional cotton planted acres' changes because of the 'higher risk' mentioned above.

The estimation results are summarized in table C-25. A main competitor in this region is corn. A 1% increment of soybean ENRs relative to cotton ENRs reduces the coming year's cotton planted acres by 0.33%, implying that cotton planted acres are relatively inelastic with respect to other crops' profit conditions. Annual dummies for 1985-1988 are used to capture dwindling planting patterns and lower yields. In this region, few cotton planted acres have been abandoned. Expected yields estimation indicates that average cotton yields in the Far West tend to increase by 13.8 pounds per acre annually.

South East

The South East has been the second largest cotton producer next to the Southern Plains. On average, this region's planted acre share had increased steadily from 11.0% in 1985 to 29.6% in 2002. In a following decade, the South East's planted acre share has hovered around 26.0% of total.

The explanatory power for next year's planted acres, harvested acres, and expected yields in the South East is fair. When estimating cotton planted acres in the South East, the lagged endogenous variable or the previous year's cotton planted acres are used. This variable replaces a trend variable which has limits in consistently capturing the regional cotton planted acres' changes because of the 'higher risk' mentioned above.

The estimation results are summarized in table C-26. Regional competition between cotton and peanuts is not statistically significant. A 1% increment of peanuts ENRs relative to cotton ENRs reduces the coming year's cotton planted acres by 0.02%. Annual dummies for 1994-2001 are used to capture an increasing tendency of cotton planting acres in this period. In the South East, few cotton planted acres have been abandoned. Expected yields estimation indicates that average cotton yields in the South East tend to increase by 9.8 pounds per acre annually. Annual dummies are used to capture unusually unstably changed yields.

Southern Plains

The Southern Plains has been the largest cotton producer, accounting for, on average, 47.2% of total planted acres and 32.2% of total production. This region's share in terms of total production is much less than total planted acres because this region's yields are relatively lower.

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Southern Plains is fair. When estimating cotton planted acres in the Southern Plains, the lagged endogenous variable or previous year's planted acres are used.

The estimation results are summarized in table C-27. A main competitor in this region is corn. Regional competition between cotton and corn is not statistically significant. A 1% increment of corn ENRs relative to cotton ENRs reduces the coming year’s cotton planted acres by 0.04%. A positive sign of cotton-corn ENRs ratio appears because corn and cotton ENRs are used as denominator and numerator. A number of annual dummies are used to capture dwindling changes in cotton planting acres.

Unlike other regions, a large portion of cotton planted acres have been abandoned and often times (figure B-14). Bad weather conditions, e.g. drought, or low market prices are likely causes for the abandonment. This phenomenon prevents solely using cotton planted acres from reasonably explaining harvested acre changes. To mitigate this problem and to capture unobservable factor, annual dummies are used for harvested acre estimation (table C-27). Expected yields estimation indicates that average cotton yields in the Southern Plains tend to increase by 5.1 pounds per acre annually, which is the lowest increase among the four regions of interest. Annual dummies are used to capture unusually unstable yields.

Cotton Demand Estimation

Major determinants of the U.S cotton demand are milling and export demand. It is noted that the USDA categorizing criterion uses, in addition to domestic and export demand, what is named ‘cotton unaccountable use’ to balance the “difference between ending stocks based on Census data and preceding season's supply and disappearance.” (USDA ERS 2014)

Domestic Milling Demand Estimation

In the U.S., cotton is the most prevailing inputs to produce fibers. It implies that cotton milling demand heavily depends on output and cotton prices. A higher fiber product price will induce the industry participants to seek a larger amount of cotton whereas higher cotton prices will reduce the quantity of cotton demanded. Time trend can be used to explain the declining use of domestically milled cotton.

The estimation results are summarized in table C-28. The explanatory power for the U.S. cotton milling demand is fair. The results show that domestic milling demand decreases over time. This trend may be because of increased input imports from the rest of world and strengthened competition in the global market (Meyer 2007). The U.S. cotton domestic demand, as a derived demand, is heavily dependent on the fiber industry. It is shown that the demand is more elastic with respect to output price (2.319) than own price (-0.374) in absolute value.

Export Demand Estimation

The U.S. cotton exports had increased, with fluctuations, prior to 1994. The exports volatility during 1985-1993 comes from unstable world cotton price and the announcement of the loan program by the U.S. (Duffy 1990). After reaching the second-lowest level in 1998, the U.S. cotton exports had increased by the mid-2000s. The declining domestic cotton use during the same period supports the structural changes mentioned earlier (figure B-15).

The estimation results are summarized in table C-29. The explanatory power for the U.S. cotton milling demand is fair. The results show that the U.S. cotton export demand increases over time and is statistically significant at the 1% level. It is shown that the demand is more elastic with respect to output price (2.319) than cotton price (-0.374) in absolute terms. Both cotton farm price and exchange rates have the expected signs, even if their statistical significance are not highly reliable. The export demand elasticity indicates that the U.S. cotton export demand is more sensitive to exchange rate changes (-1.586) than cotton real farm price (-0.336).

Summing up all of the quantities demanded by sub-categories including ‘unaccountable use’ and ending stocks equals to the total barley quantity demanded in a given year.

Adjusting National Equilibrium Price to Regional Prices

Regional cotton prices are estimated as a function of the national average equilibrium cotton price. The estimation results are summarized in table C-30. Estimation results indicate that the national equilibrium price of cotton almost perfectly accounts for regional cotton prices.

Oats

Background

Oats is widely planted in the United States but the oats’ share in total planted acres is less than, on average, 1% throughout 1985-2012. The sizes of U.S. total oat planted acres have radically reduced over time (figure B-16). The largest reduction in planted acres was observed in the Corn Belt, where oat planted acres had decreased by 6.4 million acres or 86.6% from 1987 through1994. This huge reduction comes from the expansion of corn which competes with oats in the Corn Belt (Brandt, 1992). Oats is mainly used for human consumption and livestock feed. Especially, feeding dairy animals and horses are the principal domestic use for oats (Linwood 1990).

The U.S. oat price has been sensitive to changes in the U.S. agricultural policies. For example, the rising oat price in the late-1980s was mainly due to the changed provision in farm bill enacted in 1985 (Linwood 1990). Since 2003, oat price has risen except for a sharp drop between 2008 and 2009. Over the last four years, the U.S. oat price has risen by $1.83 per bushel or 90.6%.

Supply Estimation

Regional Planted Acres, Harvested Acres, Expected Yields, and Production Estimation

In the U.S., oats is planted and harvested in most regions for livestock feeding and seeding. A commercial planting of oats is concentrated in the Northern Plains (Brandt, 1992). The Corn Belt used to be the largest production region accounting for, on average, 32.8% of total planted acres during 1985-1987. The intra-region competition with corn rapidly reduced the region's oat planted acres. Declined profitability of oats has reduced planted acres throughout the country (Linwood 1990).

Far West

The Far West has accounted for about 8% of total oat planted acres. In the Far West, oat planted acres have remained stable relative to other regions. Oat planted acres in the Far West, nevertheless, have declined from 0.65 million acres in 1985 to 0.46 million acres in 2012.

The estimation results are summarized in table C-31. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Far West is high except for expected yields. When estimating oat planted acres in the Far West, the lagged endogenous variable or previous year's planted acres are used. It is intended to prevent using trend which causes the regional planted acres to go below zero.

A main competitor in the Far West is corn as is often the case for most regions. A 1% increment of corn ENRs relative to oat ENRs reduces coming year's oat planted acres by 0.02%, supporting the hypothesis that oat planted acres are substantially inelastic with respect to other crops' profit conditions. This may be partially due to the small magnitude of oat planted acres. Expected yields estimation indicates that expected oats yields in the Far West tend to increase by 0.09 bushel per acre annually.

Lake States

The Lake States accounted for, on average, 20.1% of total oat planted acres during 1985-2012. Reduction in planted acres over the last decade decreased the region's planted acre share to 18.0%. The Lake States is still one of the largest oat production regions next to the Northern Plains.

The estimation results are summarized in table C-32. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Lake States is high except for expected yields. When estimating oat planted acres in the Lake States, the lagged endogenous variable or the previous year's planted acres are used. This usage is intended to prevent trend from forcing the regional planted acres to go below zero. It is to be noted that, in oat planted acres estimation, the ENRs ratio is calculated as oat ENRs over corn ENRs to better explain the oat planted acre changes. It is not surprising that the sign for ENRs ratio is positive. On average, only 59.5% of planted acres have been harvested. It might be because oats grown in the Lake States has been mainly used for seeding and feeding rather than commercial uses. Extremely large yield fluctuations during 1985-1993 hinder the explanatory power of expected yields estimation from being sufficiently high. Nevertheless, the estimation result indicates that the regional expected yields of oats increased, on average, 0.22 bushel per acre annually.

Northern Plains

The Northern Plains has been the largest producer of oats, accounting for, on average, 22.4% of total oat planted acres during 1985-2012. Most of commercial oat production have been concentrated in the region (Brandt, 1992). A steady reduction of planted acre has occurred in the Northern Plains. Consequently, oat planted acres in Northern Plains shrank from 2.78 million acres in 1985 to 0.37 million acres in 2010, which is followed by consecutive 2 years' increments (0.44 and 0.58 million acres in 2011 and 2012).

The estimation results are summarized in table C-33. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Northern Plains is high except for expected yields. When estimating oat planted acres in Northern Plains, the lagged endogenous variable or the previous year's planted acres are used. It is intended to prevent trend from forcing the regional planted acres to go below zero. It is to be noted that, in oat planted acres estimation, the ENRs ratio is calculated as oat ENRs over corn ENRs to better explain the oat planted acre changes. It is not surprising that the sign ENRs ratio variable is positive. The oat expected yields estimation result shows that the oat expected yields in the region increased 0.54 bushel per acre annually, which is relatively higher compared to other regions.

Southern Plains

The Southern Plains has been one of the largest producers of oats, accounting for, on average, 12.5% of total oat planted acres during 1985-2012. Compared to other major oat production regions, oat planted acres in the Southern Plains have not decreased rapidly. The region's oat planted acres have decreased 57.6% during 1985-2012. The reduction magnitude is smaller than that in the Lake States (84.4%) and the Northern Plains (87.2%). As a result, the Southern Plains' planted acre share has increased to 18.9% during the last decade. However, the Southern Plains' oat production has played a minor role in total production (3.85% during 1985-2012, on average). It is mainly due to harvesting practice and much lower yields (43.3 bushels per acre during 1985-2012, on average) compared to those in other major regions (80.9 bushels per acre in the Far West, 60.7 bushels per acre in the Lake States, and 58.3 bushels per acre in the Northern Plains).

The estimation results are summarized in table C-34. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Southern Plains is high except for expected yields. When estimating oat planted acres in the Southern Plains, the lagged endogenous variable or the previous year's planted acres are used. It is intended to prevent trend from forcing the regional planted acres to go below zero. A competitor with the Southern Plains oats is grain sorghum. The estimation result shows that a 1% increment of sorghum ENRs relative to oat ENRs reduces the coming year's oat planted acres by 0.01%, implying that oat planted acres are substantially inelastic with respect to other crops' profit conditions. In oat harvested acre estimation, it can be found that less than 30% of oat planted acres have been harvested. This point can be an important factor for explaining why the portion of the region's oat production is much lower than that of planted acres. Extremely large yield fluctuations hinder the explanatory power of the expected yields estimation from being sufficiently high. The estimation indicates that the regional expected yields of oats increased, on average, by 0.11 bushel per acre annually.

By multiplying each region's harvested acres with the corresponding expected yields, regional oat production can be estimated. Summing up all of the regions' production equals the total quantity of oats produced in a given year. Adding the total production to beginning stocks and quantity imported enables the total supply to be calculated.

Unlike other major crops such as corn and soybeans, estimation of the U.S. oats total planted acres requires 'other' regions' planted acres to be taken into account. The four major production regions of interest account for, on average, 63.0% of total planted acres during 1985-2012. The share might have a problem of under-estimating total planted acres of the U.S. oats. Thus all other regions' oat planted acres are assumed to follow past 5-years' moving average in the forecasting period. This step is applied to 'other' regions' oat production in the same manner.

Oats Demand Estimation

Seed Use Estimation

Estimation of oat seed use is straightforward in that a major determinant of oats seed use is next year's planted acres. In most regions, spring and fall oats are planted in April – May and September – October (USDA 2010). From this planting schedule, it may be inferred that oats seed use in a given year (t) may depend heavily on the expected size of planted acres in the following year (t+1). In this sense, the oats seed use equation describes the quantity demanded in time t as a function of the expected size of oat planted acres in time (t+1).

The estimation results are summarized in table C-35. An estimate for this relationship shows that of oat planted acres in the coming year account for most of the seed use and that a 1% increment in planted acres in the coming year increases oats quantity demanded for seeding by 0.84%, on average.

Feed Demand Estimation

As a feed grain, oats competes with corn and mainly fed to grain-consuming dairy units and horses. A higher oat price will reduce oats feed demand, with other things being equal. Likewise, higher prices of substituting feed crops will induce dairies consume more oats. As oats imports are tiny relative to total oats supply, domestic production plays an important role in determining the availability of oats used for feed.

The estimation results are summarized in table C-36. Estimation results show that the variables mentioned above reasonably explain changes in U.S. oats feed demand. The response of oats feed demand to feed grain prices corresponds to theoretic expectations and is statistically significant at the 10% level. A lagged endogenous variable or last year's oats feed demand is used to capture the decreasing use of oats as a feedstock over time. Oats feed demand elasticities with respect to oats and corn prices are -0.398 and 0.052. The effects of grain-consuming dairy units and domestic oat production have expected signs. The demand elasticity with respect to of grain-consuming dairy units (4.184) shows that oats feed demand is largely affected by the number of dairy units in a given year.

Food Demand Estimation

For human consumption, wheat is a main competitor with oats in the U.S. market (AGMRC). That is, the quantity of oat food demand is expected to decrease, when other things are unchanged, if its own price goes up. Higher prices of substitute crops will lead to increased quantity demanded for oats food demand. Trend variable is used to capture the increasing food demand for oats.

The estimation results are summarized in table C-37. Estimation results show that the variables mentioned above decently explain changes in U.S. oats food demand.

The response of oats food demand to the oats-wheat price ratio corresponds to theoretic expectations and is marginally significant at the 1% level. Oats feed demand is inelastic with respect to the ratio of oats and wheat (0.234) prices. Annual dummies used to explain fluctuations in oats food demand are all statistically significant at the 5% level.

Export Demand Estimation

The U.S. has played a minor role in the international oats trade. The country's share in the world oats trade market is as small as 1.58% during 1985-2012 (USDA FAS 2013). The small trade magnitude might hinder the actual competition between other feed grains for major importing markets. Oats exports estimation does not include other feed grain prices. The estimation fairly well explained the changes in barley export demand.

The estimation results are summarized in table C-38. All of the signs are in line with theoretical expectations and are statistically significant at the 10% level. Higher oat price and the U.S. dollar appreciation reduce the quantity exported. An oats export demand elasticity is larger with respect to the exchange rate (-2.158) than its own real price (-0.519).

Summing up all of the quantities demanded by each of sub-category and ending stocks equals total oats quantity demanded in a given year.

Adjusting National Equilibrium Price to Regional Prices

Regional oat prices are estimated as a function of the national average equilibrium oat price. The estimation results are summarized in table C-39. Estimation results show that the national equilibrium price of oats fits regional oat prices well.

Long Grain (LG) Rice

Background

The U.S. LG rice total planted acres have been relatively stable, averaging 2.27 million acres during 1985-2012. After reaching their peak of 2.84 million acres in 2010, total planted acres of LG rice have continuously and substantially decreased in consecutive years (1.79 and 1.99 million acres in 2011 and 2012). In the U.S., LG rice production is highly concentrated on the Delta States and especially in Arkansas. Except for the Delta States, only 16.4% of total planted acres are distributed in the Corn Belt and the Southern Plains (USDA NASS 2013). On demand side, LG rice is not a staple food in the U.S. In spite of increasing rice consumption since the late-1990s, per capita consumption of rice remained around 30 pounds.

The U.S. LG rice price has been stable between the late-1980s and mid-1990s. After experiencing rising price during 1994-1996 (up by $3.73 per cwt), LG rice price dropped until 2002 to reach $4.15 per cwt (down by $6.45 per cwt or 60.8%). Since then, the U.S. LG rice price has kept increased relative to the historical level and reached $14.50 per cwt in 2012.

Supply Estimation

Regional Planted Acres, Harvested Acres, Expected Yields, and Production Estimation

Unlike other crops, rice planted acres are relatively free from competition for arable lands. The major reason is the presence of a high entry/exit barrier. That is, such factors as large capital investments, irrigation conditions, and use of asset-specific machinery confine the degree to which rice producers can switch to other crops (AGMRC 2013). For the same reason, new entrants' participation in the rice industry can be restricted. Program payments also have mitigated market shocks by guaranteeing a 'floor' price (USDA ERS 2014). In this sense, it will be more sensible to assume that rice producers' planting decisions depend on the own profitability of rice rather than the ENRs ratio of rice and competing crops.

Delta States

In the U.S., the Delta States have been a dominant producer of LG rice accounting for 32.8% of total planted acres during 1985-2012, on average.

The estimation results are summarized in table C-40. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Delta States is fair. When estimating planted acres, the lagged endogenous variable is used to reflect rice producers' partial adjustment in making their planting decisions. Tiny magnitudes of rice ENRs coefficient and elasticity (0.042) indicate that rice producers' selection on what crop to plant may be considerably restricted by capital and physical attributes. The signs of estimates for LG rice harvested acres and expected yields are in line with expectations.

By multiplying each region's harvested acres with the corresponding expected yields, regional LG rice production can be estimated. For LG rice, 'other' regions' planted acres have to be taken into account. Thus LG rice planted acres in the Corn Belt and the Southern Plains are assumed to follow the past 5-years' moving average in the forecast period. This moving average procedure is also applied to the two regions' LG rice production. Adding up Delta States and 'other' regions' production equals the total LG rice production in a given year. Adding the total production to beginning stocks and imports enables the total supply to be calculated.

LG Rice Demand Estimation

Domestic and Residual Demand Estimation

The USDA data sets do not provide in detailed categories of LG rice domestic consumption. Therefore, the prices of LG rice and Medium/Short Grain (MSG) rice are used to estimate the changes in the aggregate domestic demand of U.S. LG rice. Annual trend is used to capture unobservable changes including residual uses.

The estimation results are summarized in table C-41. Estimation results show that all of the coefficients have expected signs and are statistically significant at the 1% level. Given that other conditions remain unchanged, 1% increment in MSG rice-LG rice price ratio increases the U.S. domestic demand for LG rice by 0.33%. The U.S. domestic demand for LG rice increases by 1.50 million cwt annually, on average.

Export Demand Estimation

The U.S. exports about a half of domestically produced LG rice. The USDA FAS statistics show that U.S. LG rice production accounts for only 1.58% of world total during 1985-2012, on average. In contrast, U.S. LG rice exports share out of world total is 12.4% during 1985-2012, on average. The relatively large share of U.S. LG rice in the global market is due to the fact that many of major LG rice producing countries consuming most of their production domestically (USDA FAS 2013). Some South East Asian countries, e.g., Thailand and Vietnam, export large amounts of LG rice and play a leading role in the global market.

The estimation results are summarized in table C-42. The U.S. domestic LG rice price and Thailand rice export price are included to explain the LG rice export demand. All of the coefficient signs are in line with expectations, but are not all statistically significant. In term of elasticity, the impact of own price changes (-0.468) is much larger in absolute terms than that of the leading exporter's price change (0.282).

Adding domestic and export demand to ending stocks equals the total LG rice demand in a given year.

Adjusting National Equilibrium Price to Regional Prices

LG rice price in the Delta States is estimated as a function of the national average equilibrium price. The estimation results are summarized in table C-43. Estimation results indicate that the national equilibrium price fits the representative region's price well.

Medium/Short Grain (MSG) Rice

Background

The U.S. MSG rice total planted acres have been much lower than those of LG rice, averaging 0.73 million acres during 1985-2012. After reaching their peak of 0.94 million acres in 1994, total planted acres of MSG rice had decreased with fluctuations until 2008. Over the last 4 years, the U.S. MSG rice planted acres have rebounded from 0.63 million acres in 2008 to 0.90 million acres in 2011 followed by a sharp drop in 2012 (0.71 million acres).

In the U.S., MSG rice production is highly concentrated in the Delta States and the Far West. California is the largest and most representative production state of MSG rice (USDA NASS 2013). The two regions produce 99.0% of the U.S. total production, on average (figure B-17).

The U.S. MSG rice price had been more stable than LG rice price through the 1980s and 1990s. Since the early-2000s, MSG rice price has been higher than that of LG rice. The price gap between the two rice varieties averaged \$3.61 per cwt over the last decade and was maximized in 2008 (\$9.90 per cwt). However, through 2010-2012, the U.S. MSG rice price has declined (by \$2.90 per cwt) whereas LG rice price has moderately risen (by \$3.50 per cwt).

Supply Estimation

Regional Planted Acres, Harvested Acres, Expected Yields, and Production Estimation

Like LG rice, MSG rice planted acres are relatively free from competition for arable lands. The largest reason is the presence of a high entry/exit barrier. That is, such factors as large capital investments, irrigation conditions, and use of asset-specific machinery confine the degree to which rice producers can switch to other crops (AGMRC). Program payments also have mitigated market shocks by guaranteeing a 'floor' price. In this sense, it will be more sensible to assume that rice producers' planting decisions depend on own profitability of rice rather than the ENRs ratio of MSG rice and other crops. It is worthwhile to note that MSG rice can be in competition with LG rice because of similar planting requirements.

Delta States

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Delta States is high. When estimating planted acres, both trend and lagged endogenous variable are used to reflect rice producers' partial adjustment in making their planting decisions and slightly but continuously decreasing planted acres.

The estimation results are summarized in table C-44. The magnitudes of MSG rice ENRs coefficient (0.001) and elasticity (0.109) are larger than those of LG rice in the same region. However, the small magnitude shows that MSG rice producers' planting decisions may be relatively insensitive to MSG rice ENRs changes. Estimation results for MSG rice harvested acres and expected yields are in line with expectations. The expected yields estimation shows that MSG rice yields in the Delta States increase by 0.96 cwt annually, on average.

Far West

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Far West is high. When estimating planted acres, both trend and lagged endogenous variable are used to reflect rice producers' partial adjustment in making their planting decisions and slightly but continuously decreasing planted acres.

The estimation results are summarized in table C-45. The magnitudes of MSG rice ENRs coefficient (0.001) and elasticity (0.019) show that MSG rice producers' planting decisions may also be restricted by capital and physical attributes. Estimation results for MSG rice harvested acres and expected yields are in line with expectations. Expected yields of MSG rice in the Far West increase by 0.26 cwt annually, on average. The expected yields increment in the Far West is substantially lower than that in the Delta States.

Summing up all of the regions' production equals the total MSG rice production in a given year. Unlike LG rice, there is little need to take 'other' regions' planted acres or production into account. Adding the total production to beginning stocks and imports enables the total supply to be calculated.

Domestic and Residual Demand Estimation

The USDA data sets do not provide in detailed categories of MSG rice domestic consumption. The prices of LG rice and MSG rice are used to estimate the changes in the aggregate domestic demand of MSG rice. Annual trend is used to capture consumption trend and unobservable changes including residual uses.

The estimation results are summarized in table C-46. According to estimation results, all of the coefficients have the expected signs and are statistically significant at the 5% level. Given that other conditions remain unchanged, a 1% increment in MSG rice and LG rice price change the U.S. domestic MSG rice demand by -0.41% and 0.29. Also, the U.S. domestic demand for MSG rice increases by 0.46 million cwt annually, on average.

Export Demand Estimation

The U.S. exports about a half of domestically produced MSG rice, accounting for only about one third of total U.S. rice exports. The small portion of MSG rice exports out of the total comes from the fact that U.S. domestic production of MSG rice is smaller than that of LG rice, and that export destination countries, e.g., Japan and South Korea, are relatively fewer than those for LG rice (USDA ERS 2014).

The estimation results are summarized in table C-47. The U.S. domestic MSG rice prices and Thailand rice export prices are included to explain the MSG rice export demand. All of the coefficient signs are in line with expectations and are statistically significant at the 1% level except for exchange rates. In terms of elasticity, the impact of domestic MSG rice price change (-0.271) is much smaller than that of leading exporter's price change (0.494). This is in contrast with the elasticity sizes of domestic price and international price observed for LG rice. Adding domestic and export demand to ending stocks equals the total MSG rice quantity demanded in a given year.

Adjusting National Equilibrium Price to Regional Prices

MSG rice prices in the Delta States and the Far West are estimated as a function of the national average equilibrium price (table C-48). Estimation results show that the national equilibrium price well fits the representative regions' prices.

Sorghum

Background

The U.S. sorghum planted acres and production in 2012 rebounded to 6.2 million acres and 248.7 million bushels (USDA NASS 2013). The NASS statistics show that despite the fact that larger acres were allocated to sorghum in 2012 compared to 5.4 million acres in 2010, sorghum production in 2012 was far below that in 2010 (334.6 million bushels). The drastic production reduction over the last 3 years was mainly attributed to severe drought in the major production regions, Central Plains and Southern Plains.

On demand side, sorghum has been used for human consumption and livestock feeding. Sorghum has never posed a remarkable position in either of the two categories.

Recently, sorghum has begun to be used to produce ethanol and about 10% of domestically produced sorghum is processed as energy inputs (AGMRC 2013).

The U.S. sorghum price had been stable at a relatively lower level ($2.07 per bushel) prior to 2003. Over the last decade, sorghum prices drastically increased to $3.72 per bushel, on average. The stiff upward trend has continued since 2009.

Supply Estimation

Regional Planted Acres, Harvested Acres, Expected Yields, and Production Estimation

Prior to the mid-1980s, the Corn Belt had been one of major sorghum production regions. Strengthened competition with corn and enactment of the 1985 Farm Bill had rapidly reduced sorghum planted acres in the Corn Belt. Consequently, sorghum planted acres in the Corn Belt declined from 1.95 million acres in 1985 to 0.76 million acres in 1990, which have been further reduced to 0.11 million acres in 2012. Historically, sorghum production is highly concentrated in the Central Plains and the Southern Plains. The two regions have accounted for, on average, 89.2% of total planted acres and 82.2% of total production (figure B-14). At the state level, Kansas and Texas are the most important production regions (USDA NASS 2013).

Central Plains

The Central Plains has been the single largest sorghum production region. Like other regions, sorghum planted acres in the Central Plains have declined over time. In the region, there have been two sharp drops and one spike in historical planted acres.

The Central Plains' sorghum planted acres drastically dropped during 1985-1991 (from 4.62 million acres to 2.78 million acres) and 2009-2012 (from 2.44 million acres to 0.91 million acres). The former was affected by enactment of the 1985 Farm Bill whereas the more recent reduction came from severe droughts. Through 1995 and 1996, the region's sorghum planted acres had doubled from 2.35 million acres to 4.65 million acres.

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Central Plains is high. To estimate planted acres, the lagged endogenous variable is used to reflect sorghum producers' partial adjustment in making their planting decisions and slightly but continuously decreasing planted acres.

The estimation results are summarized in table C-49. Estimation results show that 76.3% of arable land previously used for sorghum continues being allocated for sorghum, on average. The competition between sorghum and corn is marginally significant at the 10% level. The magnitude (-0.114) and elasticity (-0.074) are small. All of the coefficient signs for harvested acres and expected yields are in line with expectations. Historical yield fluctuations limit goodness-of-fit for the model. The estimation results show that most of sorghum planted acres are harvested and that sorghum expected yields increase by 0.22 bushel per acres annually, on average.

Southern Plains

The Southern Plains has been the second largest sorghum production region. Sorghum planted acres in the Southern Plains have declined over time. The Southern Plains' sorghum planted acres drastically dropped during 1985-1988 (from 2.78 million acres to 0.78 million acres) and 1992-1995 (from 3.95 million acres to 2.35 million acres). The former was affected by the 1985 Farm Bill whereas the mid-1990s' reduction came from unusual increases of planted acres' during 1990-1992. The recent years' severe droughts led the regional sorghum planted acres to drop to a record-low level of 0.06 million acres in 2011.

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Southern Plains is fair. When estimating planted acres, the lagged endogenous variable is used to reflect sorghum producers' partial adjustment in making their planting decisions and continuously decreasing planted acres.

The estimation results are summarized in table C-50. Estimation results show that only 43.6% of last year's sorghum planted acres continues to be allocated to sorghum. This result can be attributed to the intra-region competition with corn. The competition between sorghum and corn is marginally significant at the 10% level. However, the magnitude (0.436) and elasticity (0.079) are small. As the ENRs ratio is specified as sorghum ENRs divided by corn ENRs, having a positive coefficient sign is in line with expectations. All of the coefficient signs for harvested acres and expected yields are in line with expectations. Historical yield fluctuations limit the explanatory power of expected yields estimation. In expected yields estimation, a negative sign of time trend shows up unless the 2010-2012 yield reduction driven by droughts are controlled. In the Southern Plains, sorghum expected yields increase by 0.30 bushel per acre annually, on average.

By multiplying each region's harvested acres by the corresponding expected yields, regional sorghum production can be estimated. In addition, estimation of the U.S. total sorghum planted acres and production requires ‘other’ regions’ planted acres. The major production regions of interest, the Central and Southern Plains, account for 87.1% of total planted acres and 82.1% of total production during 1985-2012. This share might have a problem of under-estimating the total U.S. sorghum planted acres and production. Thus, all other regions’ sorghum planted acres and production are assumed to follow the past 5-years’ moving average in the forecasting period. Summing up all of the regions’ production equals the total production of sorghum in a given year. Adding the total production to beginning stocks and imports enables the total supply to be calculated.

Sorghum Demand Estimation

Seed Use Estimation

A major determinant of sorghum seed use is sorghum planted acres in coming year. In most regions including Kansas and Texas, sorghum is planted in May - June and harvested during September – November (USDA 2010). Out of this planting-harvesting schedule, it may be inferred that sorghum seed use in a given year (t) may depend heavily on the expected size of planted acres in the following year (t+1).

The estimation results are summarized in table C-51. An estimate for this relationship shows that sorghum planted acres in the coming year account for most of sorghum seed use (adj. $R^2 = 0.952$) and that a 1% increment in planted acres in the coming year is accompanied by 0.84% increment for sorghum seed use, on average.

Feed Demand Estimation

As a feed grain, sorghum competes with corn and is mainly fed to grain-consuming cattle units (USDA ERS 2014). However, sorghum's lower feed conversion ratio (FCR) prevents it from substantially replacing corn for feeding (AGMRC). A higher sorghum price will reduce sorghum feed demand with other things being equal. Likewise, higher prices of competing feed crops will induce cattle growers to feed more sorghum.

The estimation results are summarized in table C-52. Estimation results show that the variables mentioned above reasonably explains the changes in the U.S. sorghum feed demand. The response of sorghum feed demand to feed grain prices corresponds to theoretic expectations and is marginally significant at the 10% level. Sorghum feed demand's elasticity with respect to sorghum-corn price ratio is 0.064 supporting the restrictive degree to which sorghum can substitutes corn. The effects of grain-consuming-cattle-units leave a room for interpretation.

Food Demand Estimation

For human consumption, sorghum mainly competes with corn. That is, sorghum food demand is expected to decrease, with other things being equal, if its own price goes up. Also, a higher price of a substitute crop will lead to quantity of sorghum for demanded food to increase. Time trend is used to capture upward food consumption for sorghum.

The estimation results are summarized in table C-53. All of the coefficients are statistically significant at the 1% level. The quantity of U.S. sorghum demanded for food demand increases by 2.97 million bushels annually, on average. Food demand is elastic with respect to sorghum price (-5.351) and corn price (6.925). The sign for wheat price on sorghum price demand shows that sorghum and wheat might be complements for human consumption.

Export Demand Estimation

The U.S. has played a vastly major role in international sorghum trade. The country's share in world sorghum exports during 1985-2012 and 2002-2012 is 71.9% and 64.0% (USDA FAS 2013).

The estimation results are summarized in table C-54. Estimation results show that all of the signs are in line with theoretical expectations and are statistically significant at the 5% level except for exchange rates. A higher U.S. sorghum price and the appreciation of the U.S. dollar reduce the quantity exported. Being a leading exporter in international sorghum market might lead the U.S. sorghum export demand to be relatively inelastic with respect to changes in the U.S. sorghum price (-0.504) and exchange rate (-0.568).

Summing up all of the quantities demanded by sub-categories and ending stocks equals the total sorghum quantity demanded in a given year.

Adjusting National Equilibrium Price to Regional Prices

Each region's sorghum price is estimated as a function of the national average equilibrium price (table C-55). The estimation results show that the national equilibrium price fits the representative regions' prices well.

Soybeans

Background

The U.S. soybeans planted acres in 2012 was 77.20 million acres, up by 2.15 million acres from 2011 (USDA NASS 2013). However, the NASS statistics show that reduced planted acres in 2012 led soybean production to stagnate at 2.86 billion bushels.

On the demand side, soybeans have been mostly used for crushing and exports, which, in combination, accounted for more than 94.0% of total quantity demanded during 1985-2012, on average. The mandatory biodiesel usage under the RFS2 has largely increased the demand for soybean oil in recent years. As a result, soybean crushing demand has substantially increased since the mid-2000s.

The U.S. soybean price had been relatively stable except for the spikes in 1988, 1996, and 2003. Since the mid-2000s, soybeans price has risen from $5.66 per bushel in 2005 to $14.30 per bushel in 2012.

Supply Estimation

Regional Planted Acres, Harvested Acres, Expected Yields, and Production Estimation

In the U.S., soybeans are planted nationwide except for the Far West. The largest production regions include the Corn Belt (33.2 million acres during 1985-2012, on average), the Lake States (9.12 million acres), and the Central Plains (6.38 million acres). Even if not presented in figure B-15, the Northern Plains and the South East have accounted for 15.6% of total planted acres during 1985-2012, on average. The two regions have experienced different changes in term of planted acre sizes. During 1985-2012, soybean planted acres in the Northern Plains have quadrupled while those in the South East acreage declined by 39.6%.

Historically, the Corn Belt has produced 54.6% of total domestic production, on average. The region's portion is larger than that of planted acres (44.3%) because of relatively higher yields. Relatively lower yields in the Central Plains and the Northern Plains led the regions' average production shares to be smaller than their average shares in planted acres.

Corn Belt

The Corn Belt has been the single largest soybean producer. The region's historical share in planted acres has been 48.3% during 1985-2012, on average. Relatively higher yields in the region averaging 84.6 bushels per acre increased the regional share in production (62.9%) even larger.

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Corn Belt is high except for expected yields. In the Corn Belt, soybeans compete with corn for available cropland. The estimation results are summarized in table C-56. Estimation results show that 84.5% of arable lands previously used for soybeans continue being allocated for soybeans, on average. All of the coefficient signs are in line with expectations. It can be shown that soybean yields in the Corn Belt increase by 0.41 bushel per acre annually, on average.

Central Plains

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Central Plains is high except for expected yields. Like the Corn Belt, soybeans in the region compete with corn for limited planted acres. The estimation results are summarized in table C-57. Estimation results show that soybean planted acres expand by 0.21 million acres annually, on average. The competition between soybeans and corn is statistically significant at the 10% level. All of the coefficient signs for harvested acres and expected yields are in line with expectations. In the Central Plains, expected soybean yields increase by 0.59 bushel per acre annually, on average.

Delta States

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Delta States is high. Like other regions, soybeans in this region mainly compete with corn for limited available lands. The estimation results are summarized in table C-58. Estimation results show that only 70.0% of previously planted acres are continuously allocated for soybean planting. The competition between soybeans and corn in the region is not statistically significant. All of the coefficient signs for harvested acres and expected yields are in line with expectations. In the region, the average increment of expected yields (0.674 bushel per year) is higher compared to other regions.

Lake States

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Lake States is high. Like other regions, soybeans in this region mainly compete with corn for limited planted acres. The estimation results are summarized in table C-59. Estimation results show that soybean planted acres increase over time and that the competition with corn is marginally significant at the 10% level. All of the coefficient signs for harvested acres and expected yields are in line with expectations. Unusually high and low yields in the mid-2000s are controlled to better fit the expected yields changes. In the region, the average increment of expected yields (0.26 bushel per year) is much lower compared to other regions.

North East

The explanatory power for next year's planted acres, harvested acres, and expected yields in the North East is fair. Like other regions, soybeans in this region mainly compete with corn for limited planted acres. The estimation results are summarized in table C-60. All of the coefficient signs for planted acres, harvested acres and expected yields are in line with expectations.

Estimation results show that soybean planted acres increase by 0.02 million acres annually, on average. Also, the competition between soybeans and corn is statistically significant at the 10% level. In the region, the soybean expected yields increase by 0.41 bushel per year annually, on average.

Northern Plains

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Northern Plains is fairly high except for expected yields. Like other regions, soybeans in the region mainly compete with corn for limited lands. The estimation results are summarized in table C-61. All of the coefficient signs for planted acres, harvested acres and expected yields are in line with expectations. Estimation results show that soybean planted acres increase by 0.31 million acres annually, on average, and that the coefficient is statistically significant at the 1% level. Like other region, most of planted acres for soybeans have been harvested. Sporadic yield fluctuations limit the explanatory power of using annual trend for expected yields estimation. In the region, the average increment of expected yields (0.15 bushel per year) is the lowest among regions of interest.

Northern Plains

The explanatory power for next year's planted acres, harvested acres, and expected yields in the Northern Plains is fairly high. Unlike other regions, soybeans in the region mainly compete with cotton and peanuts. The estimation results are summarized in table C-62. All of the coefficient signs for planted acres, harvested acres and expected yields are in line with expectation. Estimation results show that a substantial portion of planted acres previously used for soybeans are allocated for crops other than soybeans. Relatively small portions of planted acres for soybeans have been harvested (on average, 89.6%). In the region, the soybean expected yields increase by 0.41 bushel per year annually, on average.

By multiplying each region's harvested acres with the corresponding expected yields, regional soybean production can be estimated. Summing up all of the regions' production equals the total production on soybeans in a given year. Adding the total production to beginning stocks and imports enables the total supply to be calculated.

Soybean Demand Estimation

Seed, Feed, and Residual Demand Estimation

Soybean seed, feed, and residual demand has accounted for about 5.0% of total demand during 1985-2012, on average (USDA ERS 2014). Soybean seed use is highly related with soybeans planted acres and feed use largely depends on its prices.

The estimation results are summarized in table C-63. Estimation results show that a 1% increment in next year's planted acres increases seed, feed, and residual demand by 0.85%. Higher soybean or soybean meal prices work to reduce the quantity demanded for feeding. Annual dummies are incorporated to capture unaccountable residual demand.

Crush Demand Estimation

Soybean crush demand historically has been the largest destination for the U.S. soybean consumption. It has accounted for about 60.0% of total soybean disappearance during 1985-2012. The share of soybean crush demand has declined since 2008 (on average, 52.7%).

As soybeans are crushed to produce soybean meal and soybean oil, crush demand can be regarded as a derived demand. A higher profitability of soybean processing is likely to induce processors to purchase more soybeans. In this sense, soybean crushing operating margins center on soybean crush estimation. In this study, the ratio of soybean crushing operating margins and soybean farm price is used to estimate soybean crush demand as described in equation (13).

$$\begin{aligned} \text{SB crushing operation margins} = {} & (\text{SB Meal Price} * \text{SB Meal Yields} / 2000 \\ & + \text{SB Oil Price} * \text{SB Oil Yields}) \\ & / \text{Avg. Soybean Farm Price} \end{aligned} \tag{13}$$

Calculating crushing operating margins depend on some assumptions; (1) 1 bushel of soybeans is converted into 47.39~48.18 pounds of soybean meal and 11.03~11.59 pounds of soybean oil, and (2) other operation costs remain constant over time.[8]

The estimation results are summarized in table C-64. Estimation results show that a higher operating margins-soybean price ratio increases crush demand and is statistically significant at the 10% level. The demand is inelastic with respect to the profitability changes (0.06). Time trend used to capture the changes in soybean crush demand is statistically significantly at the 1% level.

Export Demand Estimation

The U.S. soybean export demand has been one of the most important components, accounting for 36.6% of total demand during 1985-2012, on average. In recent years, U.S. soybean export demand has taken a larger share (43.8%) compared to 35.0% during 1985-2007.

The estimation results are summarized in table C-65. Estimation results show that all of the signs are in line with theoretical expectations and most are statistically significant at the 10% level. The U.S. soybean export demand has increased by 16.2 million bushels annually, on average. Higher soybean prices relative to last year's price and strengthened exchange rates work to reduce the quantities demanded by the rest of world. In terms of elasticity, soybean export demand is more elastic with respect to exchange rate changes (-0.294) than proportional changes in soybean price (-0.140).

Summing up all of the quantities demanded by each of sub-category and ending stocks equals the total soybean quantity demanded in a given year.

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8 The changes in SB meal and oil yields over time are guided by the USDA ERS.

Adjusting National Equilibrium Price to Regional Prices

Each region's soybean price is estimated as a function of the national average equilibrium price (table C-66). Estimation results show that the national equilibrium price fits the representative region's prices well. The regional variation for soybean price is relatively small.

Soybean Meal

Background

The U.S. soybean meal production had continuously increased over time to reach 43.0 million short tons in 2006. In more recent years, soybean meal production has dwindled to arrive at 38.5 million short tons in 2012. On the demand side, a large portion of soybean meal is used to feed broilers in the U.S (Soybean Meal Information Center 2013).

The U.S. soybean meal price had been stable with sporadic spikes until 2005. During 2006-2012, the soybean meal price has increased from the historical average of $194.1 per short ton to $435.0 per short ton.

Supply Estimation

When estimating the U.S. soybean meal production, this study assumes that a fixed proportion of soybean meal is produced by crushing soybeans. Based on the USDA ERS (2014) and the U.S. Soybean Export Council (2013), a bushel of soybeans is assumed to convert to 47.5 pounds of soybean meal, on average. The assumption is in line with empirical estimation results (adj. $R^2 = 0.998$, table C-67). Summing up the domestic production, beginning stocks and imports equals the total supply of soybean meal.

Demand Estimation

As mentioned above, much of the U.S. soybean meal is used to feed poultry (broiler) and dependence on export demand is relatively small, averaging 21.1%.

The estimation results are summarized in table C-68. Estimation results show that all of the signs are in line with theoretical expectations and most are statistically significant at the 10% level. The U.S. domestic soybean meal demand changes are largely affected by the number of broilers. In terms of elasticity, the domestic soybean meal demand sensitively responds to the changes in number of poultry (1.26) where as it is inelastic with respect to soybean meal price changes (-0.07). Export demand has increased by 0.14 million short ton annually, on average. Higher soybean meal prices and the appreciation of the U.S. currency reduce quantities demanded for exports. In terms of elasticity, the soybean meal export demand is more sensitive with respect to exchange rate (-1.512) rather than own price (-0.301).

Summing up all of the quantities demanded by each of sub-category and ending stocks equals the total soybean meal quantity demanded in a given year.

Soybean Oil

Background

The U.S. soybean oil production had continuously increased to reach 2.05 billion pounds in 2006. In more recent years, soybean oil production has dwindled to arrive at 1.90 billion pounds in 2012. On the demand side, human consumption had been the largest demand destination for soybean oil until the mid-2000s. Since then, the soybean oil use for biomass-based diesel production has drastically increased to reach 0.45 billion pounds in 2012 (EIA).

The U.S. soybean oil price had been stable with sporadic spikes until 1997, averaging $0.22 per pound. After going through a sharp decline during 1998-2000, the soybean oil price increased to $0.52 per pound in 2007. Again, the price fell down in the two consecutive years to reach $0.36 per pound in 2009 followed by an increase to $0.52 per pound in 2011.

Supply Estimation

When estimating the U.S. soybean oil production, this study assumes that a fixed proportion of soybean oil is produced by crushing soybeans. Based on the USDA ERS and the U.S. Soybean Export Council, a bushel of soybeans is assumed to convert to 10.7 pounds of soybean oil, on average. The assumption is in line with empirical estimation result (adj. $R^2 = 0.989$, table C-69). Summing up the domestic production, beginning stocks and imports equals total supply of soybean oil.

Demand Estimation

Much of the U.S. soybean oil has been used for human consumption until the facilitation of biodiesel production in the mid-2000s.

The estimation results are summarized in table C-70. Estimation results show that all of the signs are in line with theoretical expectations and most are statistically significant at the 10% level. In the estimation, the price of cottonseed oil is used as a representative price of substitutes for soybean oil. Using solely the price of cottonseed oil and the weighted average price of other vegetable oils make little differences in terms of estimation results. In terms of elasticity, the soybean oil domestic demand does not responds greatly to the changes in the soybean oil-cottonseed oil price ratio (0.287).

In the soybean oil export demand estimation, time trend is not statistically significant when included. Higher soybean oil prices and the appreciation of the U.S. dollar reduce quantities demanded for exports. In terms of elasticity, the soybean oil export demand is more sensitive with respect to soybean oil price (-0.697) than exchange rate changes (-0.387).

The soybean oil demand for biodiesel production is not directly estimated because of the insufficient number of observations. Instead, based on the latest available EIA data, 65% of biodiesel is assumed to be produced using soybean oil. More detailed assumptions, calculation procedures, and estimation results are presented in the Biodiesel Section in this chapter.

Summing up all of the quantities demanded by each of sub-category and ending stocks equals the total soybean oil quantity demanded in a given year.

Wheat

Background

The U.S. wheat planted acres in 2012 was 56.5 million acres, increased by 0.59 million acres from 2011 (USDA NASS 2013). Recovery from the recent drought enabled the U.S. wheat total production to rebound from 2.00 billion bushels in 2011 to 2.27 billion bushels in 2012. However, the NASS statistics show that total planted acres of wheat have decreased over time.

On the demand side, more than 80% of domestically produced wheat has been used for human consumption and exports (USDA ERS 2014). In the U.S., the share of wheat food use has steadily increased whereas that of exports has slightly decreased over time. Recent years' fluctuations in the total wheat demand caused the stock-use-ratio to be unstable over the last decade (mean of 28.53 million bushels with a standard deviation of 9.38 million bushels).

The U.S. wheat farm price had been above the trend level during 1985-1997, averaging $3.33 per bushel. However, from the late-1990s to the mid-2000s, the U.S. wheat price remains relatively stable at a low level ($3.04 per bushel, on average). In more recent years, the wheat price increased with the exception of 2009 to reach $7.80 per bushel in 2012.

Supply Estimation

Regional Planted Acres, Harvested Acres, Expected Yields, and Production Estimation

In the U.S., wheat planted acres are concentrated in the Central Plains, the Northern Plains, and the Southern Plains. The three regions account for 72.9% of total planted acres and 60.5% of total production, on average (figure B-16). Compared to the planted acres share, the three regions' share of production is relatively low because of lower yields.

Corn Belt

The estimation results are summarized in table C-71. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Corn Belt is fair. In the region, wheat and soybeans compete for available cropland. According to estimation results, all of the coefficient signs are in line with expectations. A partial adjustment coefficient (0.589) indicates that producers are more likely to switch form wheat to other crops such as soybeans or corn. Also, the harvest rate (87.3%) is relatively lower than corn (98.6%) and soybeans (99.3%) in the Corn Belt. The Historical yield fluctuations limit the annual trend's explanatory power for expected yield estimation. Estimation results show that average expected yield of wheat increase 0.46 bushel per acre annually.

Central Plains

The estimation results are summarized in table C-72. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Central Plains is fair. In this second largest production region, wheat and soybean compete for limited cropland.

According to estimation results, all of the coefficient signs are in line with expectations. A partial adjustment coefficient (0.851) supports a moderate decrement in wheat planted acres. The regional harvest rate (89.6%) is relatively high but comes with occasional up-and-downs. The region's historical yields are highly unstable with a coefficient of variation of 14.4%. The yield fluctuations limit the explanatory power of trend when estimating expected yields. In the Central Plains, the average expected yields of wheat increase by 0.19 bushel per acre annually.

Delta States

The estimation results are summarized in table C-73. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Delta States is fair. In the region, wheat and corn compete for limited cropland. According to estimation results, all of the coefficient signs are in line with expectations. A low partial adjustment coefficient (0.494) indicates that a large portion of the land used to plant wheat in the previous year is switched for planting the other crops. Most of planted acres are harvested and the harvest rate is stable over time. The region's historical yields are relatively high and increase faster than other regions (0.78 bushel per acre).

Far West

The estimation results are summarized in table C-74. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Far West is fair. In the region, wheat and barley compete for limited cropland. According to estimation results, all of the coefficient signs are in line with expectations. An extremely low partial adjustment coefficient (0.318) indicates decreasing trend in the regional wheat planted acres. Most of planted acres for wheat are harvested and the harvest rate is stable over time. The region's historical expected yield increments are moderate (0.50 bushel per acre annually).

Lake States

The estimation results are summarized in table C-75. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Lake States is moderate. In the region, wheat and soybeans compete for limited cropland. According to estimation results, all of the coefficient signs are in line with expectations. After being stabilized through 1997-2007, the regional wheat planted acres sharply increased in 2008 followed by continuous reductions. The competition with soybeans is marginally significant at the 10% level but is not severe in terms of elasticity (-0.086). Most of the planted acres for wheat are harvested and the harvest rate is stable over time. The region's historical yield increments are among the highest (0.88 bushel per acre annually).

Northern Plains

The estimation results are summarized in table C-76. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Northern Plains is moderate. In the largest production region, wheat and corn compete for limited cropland. According to estimation results, all of the coefficient signs are in line with expectations. Since 1998, the regional wheat planted acres have continuously and slowly reduced. The competition with corn is marginally significant at the 1% level but is not severe in terms of the the elasticity (-0.045). The region's historical yield increments are relatively low (0.40 bushel per acre annually) and highly unstable (CV equals to 17.26%).

South East

The estimation results are summarized in table C-77. The explanatory power for next year's planted acres, harvested acres, and expected yields in the South East is moderate. In this region, wheat and peanuts compete for limited cropland. According to estimation results, all of the coefficient signs are in line with expectations. Since 1997, the regional wheat planted acres have continuously and slowly declined until 2004. During 2005-2012, the region's wheat planted acres has shown extremely large changes; from 1.93 million acres in 2006 through 3.30 million acres in 2008 and 1.81 million acres in 2010 to 3.54 million acres in 2012. The competition with peanuts is marginally significant at the 5% level but is not severe in terms of elasticity (-0.067). The region's historical yields grow the fastest across all the regions (1.11 bushels per acre annually).

Southern Plains

The estimation results are summarized in table C-78. The explanatory power for next year's planted acres, harvested acres, and expected yields in the Southern Plains is fair. In the region, wheat and corn compete for limited cropland. According to estimation results, all of the coefficient signs are in line with expectations. Except for the mid-2000s, the regional wheat planted acres have continuously and slowly declined. This region's historical yields grow the slowest across all the regions (0.20 bushel per acre annually).

Wheat Demand Estimation

Seed Use Estimation

A major determinant of wheat seed use is planted acres in the coming year. The estimation results are summarized in table C-79. The estimate shows that the wheat planted acres in the coming year account for most of the wheat seed use and that a 1% increment in planted acres in the coming year is accompanied by a 1.05% increment in seed use, on average.

Feed and Residual Demand Estimation

As a feed grain, wheat is not as widely used as other commodities such as corn, and is mainly used to feed hogs (Luce 2007). The estimation results are summarized in table C-80. Estimation results show that all of the signs of the coefficients are in line with expectations. Increments in wheat price relative to the price of other substitutes reduce wheat quantities of wheat demanded for feed use. Cross price elasticities of wheat price relative to corn (0.743) and soybean meal (0.683) prices are relatively high,. The presence of unaccountable residual demand restricts goodness for fit of the wheat demand estimation.

Food Demand Estimation

The estimation results are summarized in table C-81. Wheat food use, along with export demand, composes the largest demand sectors for the U.S. wheat. The wheat use for human consumption steadily increased until the late-1990s, and since then has been stable. For human consumption, wheat partially competes with sorghum. That is, wheat food demand is expected to decrease, with other things being equal, if wheat's own price goes up. Higher prices of substitutes will lead to wheat food demand increases.

Export Demand Estimation

The U.S. has played a major role in the international wheat trade. The country's share in world wheat trade during 1985-2012 and 2002-2012 is 27.6% and 23.0%, (USDA FAS 2013).

The estimation results are summarized in table C-82. Estimation results show that all of the signs are in line with theoretical expectations and most are statistically significant at the 5% level. Time trend reflects the decrease in wheat exports since the mid-1990s. Higher U.S. wheat prices and the appreciation of the U.S. dollar also reduce the wheat quantity exported. In terms of elasticity, the U.S. exports are affected more by exchange rate change changes (-0.828) than wheat price changes (-0.106).

Summing up all of the quantities demanded by each sub-category and ending stocks yields the total wheat quantity demanded in a given year.

Adjusting National Equilibrium Price to Regional Prices

Each region's wheat price is estimated as a function of the national average equilibrium wheat price. Estimation results show that the national equilibrium price well fits each region's prices and that there are price variations across regions (table C-83).

Peanuts

Background

The U.S. peanuts have accounted for a small portion of the total planted acres for arable crops. The crop's total planted acres had never exceeded 1.6 million acres from 1985 through 2012, reaching its highest level of 1.58 million acres in 1991 (USDA NASS 2013).

U.S. peanut prices had been stable prior to 2002, and have experienced a sharp decline since then. The price changes are mainly due to the elimination of the price support program and marketing quotas (USDA ERS 2014). The peanut marketing quotas exclusively permitted the producers who purchased or rented rights ("quota") to sell peanuts. The restriction had fostered and maintained the U.S. peanut price at a stable and high level (Dohlman 2009a). Producers without the quota were allowed to produce and sell "additional" peanuts for restricted uses, for example, processing for feed and exports (Dohlman 2009b). The “non-quota” producers’ received price and support level (loan rates) were substantially lower compared to the producers having a quota (USDA ERS 2014).

The elimination of the peanut marketing quota and price support provisions in the 2002 Farm Bill had massive impacts on the U.S. peanut sector (Dohlman 2009a, 2009b). The U.S. peanut farm price changes prior to and after the 2002 reform are presented in figure B-17. During 1985-2001, the U.S. average peanut farm price was $622.5 per ton and was stable (standard deviation equals to $55.1 per ton). In contrast, during the following decade, the U.S. peanut farmers have faced a lower price ($479.2 per ton, on average) with higher variations (standard deviation equals to $99.3 per ton).

The structural change also affected the peanut sector via reduced planted acres across regions. The U.S. peanut total planted acres averaging 1.61 million acres during 1985-2001 reduced to 1.36 million acres during 2002-2012, on average. The change has been more severe in the Southern Plains where planted acres have decreased by 41.2% while the South East experienced a 7.9% reduction.

Supply Estimation

Regional Planted Acres, Harvested Acres, Expected Yields, and Production Estimation

The South East including Georgia, Alabama, and Florida is the most representative peanut production region. The South East itself has produced 76.2% of total peanuts planted acres and 78.4% of total production during 1985-2012, on average (figure B-18). Most of the rest of the peanuts come from the Southern Plains (23.3% of total planted acres and 21.1% of total production, on average).

South East

In the South East, peanuts compete with cotton. Also, a rotational practice between peanuts and cotton is observed. The estimation results are summarized in table C-84. The explanatory power for next year's planted acres, harvested acres, and expected yields in the South East is fair. When estimating planted acres, annual trend is used to capture the continuously decreasing planted acres. Estimation results show that peanut acre decreases about 11.8 thousand acres annually, on average. The competition between peanuts and cotton is not statistically significant. A positive sign of the ENR ratio appears because peanuts and cotton ENRs are used as denominator and numerator. All of the coefficient signs for harvested acres and expected yields are in line with expectations. In the region, average peanut expected yield increases by 26.5 pounds per acre annually.

In the South East, multiplying harvested acres with the corresponding expected yields equals the region's peanut production. In addition, estimation of the U.S. total peanut planted acres and production requires the Southern Plains' planted acres. Therefore, the Southern Plains' peanut planted acres and production are assumed to follow past 5-years' moving average in the forecast period. Summing up all the regions' production equals the total quantity of peanuts produced in a given year. Adding the total production to beginning stocks and imports enables the total supply to be calculated.

Seed, Loss, Shrinkage, and Residual Demand Estimation

The USDA utilization/disappearance data do not provide comprehensive information regarding how U.S. peanuts are consumed other than crushing and exports. The presence of 'unaccountable' usages such as loss, shrinkage, and residual prevents the demand category from being reasonably estimated (adj. $R^2 = 0.713$). The estimation results are summarized in table C-85. Estimation results show that the 'lump-sum' demand for peanuts tends to increase about 8.50 million pounds annually, on average.

Crush Demand Estimation

Peanuts are crushed to produce peanut meal and oil which are used for feedstock and human consumption. In this sense, peanut crush demand heavily depends on the quantity demanded by peanut processors. Therefore, the profitability of peanut crushing can be a major determinant of peanut crush demand. Calculating peanut crushing margins requires the following. First, using peanut-crushing outputs prices and processing yields allows peanut processing revenues to be calculated. Guided by Shumaker, McKissick, and Smith (2009), a pound of peanuts is assumed to convert into 0.52 pounds of peanut meal and 0.48 pounds of peanut oil. In other words, peanut crushing margins per pound equals to (0.52 * peanut meal price + 0.48 * peanut oil price). Second, per unit production costs are required to calculate the per-unit crushing margins. It is, however, to be noted that unlike peanut prices, operation costs are virtually unavailable. Hence, it is assumed that peanut processing operational costs and fixed costs remain constant over time. Based on the assumptions, per-pound peanut crushing margins can be obtained by subtracting the operational costs from the processing revenues. Annual trend and dummies are used to capture unobservable factors when estimating peanut crushing demand.

The estimation results are summarized in table C-86. The explanatory power for peanut crushing demand is fair. Estimation results show that domestic peanut crushing demand decreases about 11.8 million pounds annually, on average. A 1% increment in crushing margins is expected to increase the quantity demanded by processors by 0.02%.

Food Demand Estimation

Food demand is the most important utilization category for U.S. peanuts. The food demand accounts for 56.8% of total peanut demand during 1985-2012, on average (USDA ERS 2014). The largest component of the peanuts food demand is peanut butter. The U.S. peanut butter consumption remained stable until the early 2000s, followed by slight increments. Peanut butter prices are the most important determinant affecting peanut food demand. However, in the estimation, real peanut prices are used as a proxy for peanut butter prices because of data availability. The estimation results are summarized in table C-87. The explanatory power for peanuts food demand is high. Estimation results indicate that domestic peanuts food usage is inelastic with respect to peanut price (-0.252).

Export Demand Estimation

The U.S. is a net exporter of peanuts whose largest destination is Canada (USDA FAS 2013). The estimation results are summarized in table C-88. The U.S. peanut exports have experienced huge fluctuations over time. Prior to the mid-2000s, the U.S. peanut exports had decreased. However, the peanut exports faced a large increase in 2012 (1.2 billion pounds), increased by 120.2% compared to 2011. In terms of elasticity, the quantity exported is sensitive to both peanut price (-1.40) and exchange rate changes (1.38).

Summing up all of the quantities demanded domestically and internationally, and ending stocks equals the total peanuts quantity demanded in a given year.

Ethanol

Background

The biofuels industry has grown rapidly since the 2000s. The U.S. domestic ethanol production has increased from 38.6 million barrels in 2000 to 332.1 million barrels in 2011 (EIA 2013). Ethanol consumption has increased from 39.7 million barrels in 2000 to 306.5 million barrels in 2011 (EIA 2013). In the U.S., ethanol is mainly produced using sugars derived from grain. The most widely used input is corn starch (EIA 2012). It may explain the concentrated location of ethanol plants in the Midwest or the Corn Belt, the largest corn production region. As of September 2010, ethanol plants in the Corn Belt produced 5.56 billion gallons per year, accounting for 42.9% of total production (Cardno ENTRIX 2010).

The U.S. biofuels industry has been heavily dependent on government policies which have provided tax incentives and guaranteed the market (Schnepf 2012; Yacobucci 2013). Representative of such policies include the Renewable Fuel Standard (RFS) and the Volumetric Ethanol Excise Tax Credit (VEETC).

In this study, ethanol prices are represented by the average rack prices (F.O.B.) in Omaha, Nebraska. The representative prices had been stable through 1985-2002 (on average \$1.23 per gallon with standard deviation of \$0.16 per gallon). Since 2003, the ethanol price has risen rapidly and become more sensitive to market conditions (on average, \$2.09 per gallon with standard deviation of \$0.44 per gallon).

Supply Estimation

In the U.S., wet milling and dry milling are the most widely used technologies to produce corn-based ethanol. Wet milling had been a major production process for ethanol, whereas dry milling is becoming the prevailing process (Hoffman and Baker, 2010; Hoffman, 2011).

The concept of dry milling (DM) and wet milling (WM) operating margins centers on the estimation of each facility's demand for corn. In this study, milling operating margins are defined as a difference between total operation revenue and total operation costs. The dry milling operating margins are calculated in equation (14).

$$\text{(14)}\quad \begin{aligned} \text{DM operating margins} = {} & \text{Ethanol Rac Price} \\ & + \text{DDG Price} * \text{DDG Yield} * 0.364 / 2204.622 \\ & - \text{Avg. Corn Farm Price} * 0.364 - \text{Cash Operating Costs} \\ & + \text{Ethanol Tax Credit} \end{aligned}$$

Calculating the dry milling operating margins depends on several assumptions; (1) a bushel of corn is converted into 2.75 gallons of ethanol; (2) a bushel of corn is used to produce 17.5 pounds of dried distillers grains (DDGs). That is, it has been assumed that 0.364 bushel of corn is used to produce a gallon of ethanol and 6.37 pounds of DDGs. The second assumption is employed to calculate revenue from DDGs when producing a gallon of ethanol. In turn, the value calculated with the assumption (2) is divided by 2204.622 to convert the price of DDGs per ton to the price per pound. In a similar way, the unit of corn price has been adjusted. The ethanol rack price and operation costs are expressed in dollars per gallon. The Tax Reform Act of 1984 provided ground for subsidizing corn-based ethanol blending by exempting \$0.52 ~ \$0.60 per gallon. When the Volumetric Ethanol Excise Tax Credit was in effect by the American Job Creation Act of 2004, the subsidy was reduced to \$0.51 per gallon. The 2008 Farm Bill reduced the amount to \$0.45 per gallon (USDOE AFDC 2014). The cash operation costs are guided by Hofstrand and Johanns (2013).

A similar calculation procedure can be applied to calculate the wet milling operating margins with some adjustments. The wet milling technology's byproducts include gluten meal, gluten feed, and corn oil. Considering the change, the wet milling operating margins are calculated as follows in equation (15).

$$
(15) \quad \begin{aligned}
\text{WM operating margins} = {} & \text{Ethanol Rac Price} \\
& + (\text{Gluten Meal Price} * \text{Gluten Meal Yield} * 0.377 / 2204.622) \\
& + (\text{Gluten Feed Price} * \text{Gluten Feed Yield} * 0.377 / 2204.622) \\
& + (\text{Corn Oil} * \text{Corn Oil Yield} * 0.377) \\
& - \text{Avg. Corn Farm Price} * 0.377 - \text{Cash Operating Costs} \\
& + \text{Ethanol Tax Credit}
\end{aligned}
$$

Assuming that a bushel of corn is used to produce 2.65 gallons of ethanol with the wet milling technology, it follows that 0.377 bushel of corn is converted into a gallon of ethanol, 1.169 pounds of gluten meal, 4.863 pounds of gluten feed, and 0.603 pounds of corn oil. The conversion factors, along with the previously used calculation steps, allow all of the terms in the right-hand side to be expressed in dollars per gallon.

Because this study does not incorporate the byproduct markets into the model, the prices for the wet milling byproducts should be estimated to forecast the operating margins. DDGs, gluten feed, and gluten meal prices are estimated with corn and other input prices. Corn oil price is estimated using its substitute, soybean oil price (table C-89).

Dividing the operating margins by the U.S. GDP deflator converts them in constant dollar terms. The real values are used to estimate dry and wet milling operators' demand for corn (table C-90). Trend is included in the ethanol demand relationships to capture unobserved and/or drastic changes since mid-2000s. The total quantity of corn used to produce a corn-based ethanol is simply a sum of quantity consumed by dry milling and wet milling processors. For dry milling operations, increased real operating margins lead to larger quantities of corn demanded. Unusually large elasticities of the corn demand with respect to time (365.91) reflects the drastic expansion of corn-based ethanol production over the last decade. The ethanol production is also elastic with respect to operating margins (1.33). For wet milling operations, the changes in production are less elastic with respect to trend (67.3) and operating margins (0.04).

Demand Estimation

Domestic Demand Estimation

The estimation results are summarized in table C-91. Estimation results show that all of the signs are in line with theoretical expectations and most are statistically significant at the 1% level. The number of flex-fuel vehicles treated exogenous works to increase the amounts of ethanol for transportation use. Higher acquisition costs of petroleum shift ethanol demand to the right whereas higher ethanol prices reduce the quantity demanded. In terms of elasticity, both changes in oil price (0.618) and ethanol price (-0.709) have similar impacts but in opposite directions.

Export Demand Estimation

The estimation results are summarized in table C-92. Estimation results show that all of the signs are in line with theoretical expectations and all are statistically significant at the 5% level. All of the independent variables are identical to those in the domestic demand equation except for time trend in place of the number of vehicles. Higher acquisition costs of petroleum shift ethanol demand to the right whereas higher ethanol prices reduce the quantity demanded. In terms of the elasticity, the ethanol export demand is much more sensitive to changes in oil price (-11.89) and ethanol price (16.96) compared to domestic demand. A negative sign for cross price elasticity comes from the fact that a higher oil price increases the domestic demand for ethanol and/or imports, thus leaving a smaller room for net exports of ethanol. A higher domestic ethanol price is expected to induce producers (blenders) to develop markets abroad, having The sign for own price elasticity be positive.

Summing up all of the quantities demanded by each of sub-category and ending stocks equals to the total ethanol quantity demanded in a given year.

Biodiesel

Background

The U.S. biomass-based diesel (biodiesel) industry has drastically expanded since the early-2000s. Domestic biodiesel production has increased from 17.1 thousand barrels in 2001 to 1,965.7 thousand barrels in 2012 (EIA 2013). The U.S. domestic biodiesel consumption has increased from 20.4 thousand barrels in 2001 to 1,776.2 thousand barrels in 2012 (EIA 2013). The EIA statistics show that biodiesel plays a tiny role in the U.S. energy market compared to petroleum and ethanol. In the U.S., biodiesel production is concentrated in some states. As of August 2013, biodiesel plants in Texas, Iowa, Missouri, and Illinois account for 47.7% of total production (EIA 2013).

The U.S. biodiesel industry has also depended heavily on government policies (Schnepf 2012; Yacobucci 2013). Representative of such policies include the Renewable Fuel Standard (RFS), the Biodiesel Income Tax Credit and the Biodiesel

Mixture Excise Tax Credit. The tax credits had been expected to expire at the end of 2012, have been extended to the end of 2013 (USDOE AFDC 2014).

In this study, biodiesel prices are represented by the national average prices of BD100 provided by the Clean Cities Alternative Fuel Price Report (USDOE AFDC 2014). The representative prices data are not available until 2001. A short time-span data shows that the average price of biodiesel has risen during 2001-2012.

Supply Estimation

In the U.S., the main inputs for biodiesel production include soybean oil, other vegetable oil, and animal fat (USDA ERS 2014). The use of the inputs totaled 3.3 billion pounds in 2009 and has increased to 6.0 billion pounds in 2012 (EIA 2013). In 2012, soybean oil is the most prevailing input accounting for 66.9% of total inputs (EIA 2013).

The concept of operating margins centers on the estimation of biodiesel production and the demand for soybean oil. In this study, operating margins are defined as the difference between the total operation revenue and the total operation costs. The biodiesel operating margins are calculated in the equation (16).

$$\begin{aligned}\text{DM operating margins} = {} & (\text{Biodiesel Price} + \text{Glycerin Price} * 0.75) \\ & - (\text{Soybean Oil Price} / \text{Biodiesel Yields} \\ & + \text{Methanol Price} * \text{Biodiesel Yields} * 0.75) \\ & - \text{Cash Operating Costs} + \text{Biodiesel Tax Credit}\end{aligned} \tag{16}$$

Calculating biodiesel operating margins assumes that 1.028 pounds of soybean oil and 0.103 pound of methanol are converted into a pound of biodiesel and 0.103 pounds of glycerin. That is, it has been assumed that 7.5 pounds of soybean oil and 0.75 pounds of methanol are required to produce 1 gallon of biodiesel and 0.75 pounds of glycerin. The multiplier for glycerin price and methanol price is used to reflect the conversion rates in the formula. All of the terms are expressed in dollars per gallon. The Biodiesel Mixture Excise Tax Credit in effect in 2005 has provided blenders with tax credit in the amount of $1.00 per gallon. The incentive provision was to expire at the end of 2011, but has been extended to the end of 2013 (USDOE AFDC 2014). Cash operation costs are guided by Hofstrand and Johanna (2013). Because this study does not incorporate glycerin markets into the model, so the prices of glycerin are treated as exogenous.

Dividing the operating margins by the U.S. GDP deflator converts them in constant dollar terms. The real values are used to estimate biodiesel production and the operators' demand for soybean oil (table C-93). Trend is included in ethanol demand relationships to capture unobserved and/or drastic changes since the early-2000s.

Estimation results show that increased real operating margins lead to larger quantities of soybean oil being demanded. Unusually large elasticities of corn demand with respect to time (377.9) reflects the drastic expansion of biodiesel production over the last decade. As assumed earlier, soybean oil accounts for 65% of total inputs to produce biodiesel. Thus, dividing the estimated biodiesel production by 0.65 can be used to approximate the U.S. total biodiesel production. Also, using the conversion ratios between soybean oil and biodiesel allows the quantity of soybean oil demanded for biodiesel production to be calculated.

Demand Estimation

Domestic Demand Estimation

The estimation results are summarized in table C-94. Estimation results show that all of the signs are in line with theoretical expectations and most are statistically significant at the 5% level except for the No.2 retail on-highway diesel price. The U.S. domestic biodiesel demand is negatively affected by retail on-highway diesel price. Nevertheless, annual trend works to increase domestic demand for biodiesel. In terms of elasticity, domestic biodiesel demand sensitively responds to price changes (-1.10).

Export Demand Estimation

The estimation results are summarized in table C-95. Estimation results show that all of the signs are in line with theoretical expectations and all are statistically significant at the 1% level with an exception. A lagged dependent variable replaces time trend to better capture fluctuations in the biodiesel net exports. Higher biodiesel prices lead to reduced exports and/or larger imports. In terms of elasticity, however, biodiesel net export demand is insensitive to the price changes (-0.09). Annual dummies are used to capture the changes in net exported caused by 'splash-and-dash' and 'closing a loophole' in the mid- and late-2000s.

Summing up all of the quantities demanded by each of sub-category and ending stocks equals total biodiesel quantity demanded in a given year.

Model Validation

This study will validate the model to verify if parameter estimates are consistent with economic theory, if empirical analysis results are consistent with the expected changes, and if the magnitude of changes makes sense. To this end, the most widely used method of root-mean-square error (RMSE) is utilized. In a forecast model, RMSE of forecasted values of a dependent variable in time t ($\hat{Y}_t$) compared to Y_t can be calculated as in equation (17).

$$(17)\quad \text{RMSE} = \sqrt{\frac{\sum_{t=1}^{n}(Y_t - \hat{Y}_t)^2}{n}},$$

where n denotes the number of predictions.

As RMSE is unit-dependent, mean-absolute-percentage error is accompanied to measure the performance of the model in equation (18).

$$(18)\quad \text{MAPE} = \frac{1}{n}\sum_{t=1}^{n}\left|\frac{Y_t - \hat{Y}_t}{Y_t}\right|,$$

where n denotes the number of predictions.

The validation results are summarized in table C-96. Model validation results demonstrate that 132 equations out of in total 152 equations have MAPE values less than 10.0% (86.8%). Most of equations with the MAPE values exceeding 10% are relevant with the expected yields or residual demand. Allowing the model to run a stochastic simulation may mitigate the problem.

CHAPTER V

FORECAST RESULTS: BASELINE

Key Assumptions

In this study, the baseline assumes that macro and policy environments remain *status quo* when forecasting the changes in the U.S. crop sector over the next decade. The 'reference' values (price, planted acres, ENRS by crop) may be compared with those under alternative scenarios to analyze the impacts of external shocks of interest.

Major assumptions involved in the baseline include the following: (1) Agricultural trade-weighted exchange rates stay at the 2012 level; (2) the RFS2 mandates are not in affect during 2013-2022; and (3) the agricultural provisions in 2008 Farm Bill (Loan Rates, Target Price, Marketing Loan Gains, Direct Payments, and Counter Cyclical Payments) are assumed to remain at the 2012 level during 2013-2022.[9]

Forecast Results

Corn

National Equilibrium Price

The U.S. national corn price has continuously risen since 2009. According to the baseline forecast, the corn price would stabilize, averaging $4.55 per bushel during 2013-2022 (figure B-19). A substantial drop in price from $6.95 per bushel in 2012 to

[9] More detailed descriptions of the exogenous baseline for key variables including crude oil acquisition costs, exchange rates are provided in Table A-2.

$4.27per bushel in 2013 is likely due to the rebounded production out of the recent drought. During the forecast period, the corn price ranges between $4.31 and $6.51 per bushel, averaging $5.73 per bushel.

Total Planted Acres

The U.S. corn total planted acre expansion has been spurred by the unusually high crop prices during the mid- through late-2000s. The forecast results indicate that the total planted acres would return closer to the trend level (figure B-20). The sharp drop between 97.4 million acres in 2013 to 88.0 million acres in 2014 is due to corn producers' responding to the low corn price in 2013 as they allocate less land for corn. After 2014, the total planted acres are projected to increase to reach 93.8 million acres in 2022. The Corn Belt is projected to maintain the position of the largest corn producer, accounting for 42.3% of the total planted acres during 2013-2022, on average. The region's average share in planted acres would decrease to 42.3% during 2013-2022, slightly lower compared to the historical average of 44.9%. Similarly, the Central Plains and the Lake States are forecasted to account for 18.1% and 15.5% of the total planted acres. The share of all other regions in corn planted acres is forecasted to be stable.

Production

The U.S. total corn production depends on harvested acres and yields. Compared to the harvested acres, the corn yields have had a larger effect on the production because of larger volatility. After several years' of lower production due to the droughts in the

Midwest, the total corn production is projected to rebound and hang around the trend level (figure B-21). The corn production in 2013 is forecasted to be 12.5 billion bushels and increase to reach 14.9 billion bushels in 2022. At the regional level, the share of the Corn Belt and the Lake States are forecasted to reduce whereas that of the Central Plains and other regions increases.

Demand

The U.S. corn total demand is forecasted to increase from 13.1 billion bushels in 2013 to 14.8 billion bushels in 2022. The coefficient of variation (4.37%) shows that each category of the corn demand remains stationary during 2013-2022 (figure B-22).

An interesting point can be found by comparing the historical and projected demand by categories. First, larger amounts of corn are forecasted to be used to produce ethanol even when assuming the absence of the RFS2. Over the forecast period, the share of corn as energy sources increases from 30.2% in 2013 to 34.7% in 2022. The increase becomes more evident when compared to the historical portion of 13.6% during 1985-2012, on average. Second, increased use of corn for biofuel production tightens the corn availability for feedstock as was experienced in the mid-2000s. During 2013-2022, the share of corn feed use is projected to average 41.6%. Corn feed use will still be the largest demand sector, but that the share will be substantially reduced compared to the historical average of 54.2% during 1985-2012.

The U.S. corn export demand is forecasted to be stable over the coming decade. The forecasted corn export share averages 14.3% over 2013-2022, which is moderately lower than the historical level, averaging 19.0% during 1985-2012.

Expected Net Returns (ENRs)

For illustrative purpose, the corn ENRs changes in the three largest production regions (the Corn Belt, the Central Plains, and the North East) are provided. More detailed information on the changes of regional corn ENRs is available in Appendix D.

The corn ENRs are forecasted to be closer to the historical level, but remain at a higher level (figure B-2). It implies that, in spite of increasing variable production costs, the regional producers' average net gains are forecasted to increase owing to favorable market conditions. A similar change for corn ENRs is found in other regions that are not presented in figure B-23.

Dependence on program payments (MLG, DP and CCP) varies across regions. However, the projected program payments are small relative to the total corn ENRs (4.48% in the Corn Belt, 5.60% in the Central Plains, and 5.72% in the North East, on average).

Barley

National Equilibrium Price

The U.S. national average barley price has radically risen since 2006. According to the forecast results, the barley price would drop from $6.40 per bushel in 2012 to

$4.31 per bushel in 2013 (figure B-24). In later years, the barley price is forecasted to keep rising from $5.35 per bushel in 2014 to $6.51 per bushel in 2022. The projected price changes can be attributed to declining planted acres over time. As the effects of a declining trend for planted acres overwhelm the effects of higher barley ENRs, relatively less planted acres are forecasted to be allocated to barley. The coefficient of variation (10.33%) supports the barley price's divergence over the forecast period.

Total Planted Acres

The U.S. total barley planted acres' continuous decline has been reverted during 2010-2012. The forecast results indicate that the U.S. total planted acres of barley would keeping declining from 3.64 million acres in 2012 (figure B-25). A marginally decreasing reduction will enable the total planted acres to stay above trend during the forecast period. Consequently, the total planted acres are projected to decrease from 3.34 million acres in 2013 to 3.01 million acres in 2022.

Production

The U.S. total barley production largely depends on harvested acres and yields. The increments in barley production owing to increasing expected yields may be partially offset by planted/harvested acre reduction. During 2013-2022, mitigated reduction of the barley planted acres and increased expected yields are forecasted to maintain barley production above trend (figure B-26). The percentage reduction in the total production from 2014 to 2022 (-1.71%) is smaller than that of the planted acres (-12.3%) in absolute terms.

Demand

The forecast results show that the U.S. barley total demand is projected to average 213.0 million bushels during 2013-2022 (figure B-27). The reduction in barley feed use and export demand mainly come from the response to the higher barley price. In contrast, the barley food demand is projected to increase by 26.6% over the forecast period. Combined with the reduction in feed and export demand, the share of barley food use is forecasted to increase from 63.5% in 2013 to 85.7% in 2022.

Expected Net Returns (ENRs)

The changes of barley ENRs in the Far West and the Northern Plains are presented in figure B-28. The ENRs are forecasted to keep increasing owing to the price changes during 2013-2002. The continuously declining total planted acres indicate that the higher barley ENRs may not provide producers with sufficient incentives to expand barley production.

Dependence on program payments (MLG, DP and CCP) appears higher in the Northern Plains than in the Far West. The projected program payments are small relative to total barley ENRs (2.67% in the Far West and 4.42% in the Northern Plains, on average).

Cotton

National Equilibrium Price

The U.S. national average cotton price has risen since 2001. Cotton price is forecasted to continue rising to reach $1.24 per pound in 2014 (figure B-29). The projected price pattern can be attributed to the reduced planted acres and production during 2012 and 2013. After reaching the highest peak in 2014, the cotton price is projected to keep declining until 2022, averaging $0.80 per pound.

Total Planted Acres

The U.S. cotton total planted acres were reduced during 2006-2009. In the following years, the planted acres have rebounded from 9.01 million acres in 2009 to 14.43 million acres in 2011. However, the total planted acres again shrank to 12.12 million acres in 2012.

The forecast results indicate that the latest reduction in 2012 would to have aftermaths such that the total planted acres are as small as 9.73 and 10.65 million acres in 2013 and 2014 (figure B-30). The reduced planted acres are expected to decrease cotton production and, thus, lead to higher cotton prices. Over the rest of forecast period, the planted acres are forecasted to be stable, averaging 11.71 million acres.

At the regional level, the cotton planted acres are forecasted to decrease in all regions except for the Southern Plains. During 2013-2022, the Southern Plains' share of the total planted acres is projected to be 54.7%, larger than the average historical level of 48.9%.

Production

The cotton production more heavily depends on yields than harvested acres. A huge volatility of cotton yields in the Southern Plains has largely affected the historical production. That is, unpredictable changes, e.g., weather conditions, may have massive impacts on the cotton yields, and in turn, production.

The forecast results indicate that the U.S. cotton total production is projected to continuously increase from 6.28 billion pounds in 2013 to 8.26 billion pounds in 2017 (figure B-31). Throughout the rest of forecast period, the total production would be stable, averaging 8.50 billion pounds.

At the regional level, the production share of the Southern Plains and the South East is forecasted to increase by 21.6% and 21.3% during 2013-2022. However, production in the Far West is projected to decrease by 41% compared to the historical level.

Demand

The forecast results show that the cotton total demand would increase during 2013-2022 (figure B-32). A major momentum for the increase comes from the increasing export demand. The U.S. cotton export demand is projected to continuously increase from 6.63 billion pounds in 2013 to reach 8.10 billion pounds in 2022.

In contrast, strengthened competition with imported textile inputs is expected to compress the U.S. textile industry’s demand for domestically produced cotton. As a result, the U.S. domestic milling demand is forecasted to experience a 50% drop during

2013-2014 (from 1.61 billion pounds to 0.84 billion pounds). The domestic demand is forecasted to recover to 1.03 billion pounds in 2017. In later years, the domestic milling demand is forecasted to decrease from 0.97 billion pounds in 2018 to 0.43 billion pounds in 2022.

Expected Net Returns (ENRs)

The cotton ENRs changes in major production regions are presented in figure B-33. The cotton ENRs are forecasted to keep increasing until 2014 owing to favorable market conditions. For the rest of the forecast period, a lower cotton price is forecasted to directly decrease the ENRs. The change is forecasted to be more severe in the Southern Plains as the region's cotton ENRs are projected to be negative after 2018.

Dependence on program payments (MLG, DP and CCP) is relatively small, ranging from 3.42%~11.60% across all regions. It implies that, under the current program provisions, program payments might not effectively mitigate the 'high risk' embedded in cotton industry.

Oats

National Equilibrium Price

The U.S. national oat price has gone through huge fluctuations since 2004. The forecast results show that the oat price would begin declining after 2014 (figure B-34). The price is projected to fall from $3.85 per bushel in 2012 to $2.08 per bushel in 2013, followed by a recovery to $2.32 per bushel in 2014. After 2014, the U.S. oat price is forecasted to decline to $2.07 per bushel in 2022.

Total Planted Acres

The U.S. oat total planted acres have continuously declined. The forecasts indicate that the declining trend will maintain (figure B-35). The total planted acres are forecasted to average 3.22 million acres, similar with that of 2005-2012 (3.44 million acres, on average). A large variation in the planted acres during 2005-2012 (standard deviation equals to 0.51 million acres) is forecasted to disappear (standard deviation equals to 0.05 million acres)

In all of the regions of interest, the planted acres are forecasted to decrease. The extent of reduction varies across regions. In the Far West, the Lake States, and the Northern Plains, more than a half of the land historically used for oat production are forecasted to be allocated for other uses. In the Southern Plains, about 71% of historical oat planted acres are forecasted to be used for oat production, on average.

Production

U.S. total oat production depends on harvested acres and yields. The forecasted changes in oat production are similar to those for oat planted acres (figure B-36). The total production is projected to be stable, averaging 108.38 million bushels during 2013-2022. An average annual production increase of 0.12 million bushels is forecasted. At the regional level, the production share of major production regions except for the Far West is forecasted to remain stable.

Demand

The U.S. oat total demand is forecasted to recover from the drop in 2010-2012 and remain stable slightly above 200 million bushels during 2013-2022 (figure B-37). The oat feed and food demand are projected to account for, on average, 47.4% and 29.7% of the total demand. The portion of seed and export demand is 4.83% during 2013-2022, on average. Increasing food demand and decreasing feed demand are forecasted to last over the coming decade. The share of feed demand is forecasted to decrease from 71.0% during 1985-2012 to 57.9% during 2013-2022. Food demand is forecasted to increase from the historical average of 22.8% to 36.3% during 2013-2022.

Expected Net Returns (ENRs)

The oat ENRs changes in major production regions are presented in figure B-38. The oat ENRs are forecasted to keep increasing until 2015. For the rest of the forecast period, oat producers' profitability is forecasted to deteriorate.

Dependence on program payments (MLG, DP and CCP) is relatively small compared to those for other crops, ranging from 1.00%~2.52% across regions. The result can be attributed to relatively lower program payment rates and base yields.

Long Grain (LG) Rice

National Equilibrium Price

The U.S. national average LG rice price has, with a few exceptions, risen through the 2000s. The forecast results show that the price would rise until 2013 and then stabilize at a higher level from the historical average (figure B-39). During 2015-2022, the projected LG rice price averages $15.51 per cwt.

Total Planted Acres

The LG rice total planted acres have not shown a statistically significant trend. The forecast results indicate that the planted acres are projected to recover from the reduction during 2010-2012 and that they would stabilize around 2.50 million acres during 2013-2022 (figure B-40).

At the regional level, the Delta States undoubtedly will be the largest production region during 2013-2022. In terms of the percentage changes, other regions such as the Corn Belt or the Southern Plains are forecasted to show larger increase in planted acres.

Production

The LG rice total production changes have been highly correlated to the planted acres changes (correlation coefficient equals to 0.83, statistically significant at the 1% level). It implies that the LG rice total production is expected to recover from the recent years' reduction and stabilize during 2013-2022. During 2013-2022, the total production is projected to range between 89.4 and 93.1 million cwt (figure B-41). The Mississippi

Delta region is forecasted to be responsible for 92.4% of total domestic production during the forecast period, on average.

Demand

The U.S. LG rice total demand is forecasted to continue to increase during 2013-2022 (figure B-42). Both domestic and export demand are forecasted to increase during 2013-2022. The average increase rates for the domestic and export demand during the forecast period are 22.4% and 23.1%.

Expected Net Returns (ENRs)

The LG rice ENRs changes in the representative region are presented in figure B-43. The forecasted market conditions and increasing expected yields are in favor of the LG rice producers via higher ENRs. It implies that, in spite of increasing variable production costs, the regional producers' net returns are forecasted to increase. However, physical and agronomic surroundings might be a high entry barrier preventing other producers from newly entering the LG rice industry.

Dependence on program payments (MLG, DP and CCP) is extremely low during the forecast period. Projected prices are expected to remain at a high level, so there is little room for the program payments to be triggered.

Medium/Short Grain (MSG) Rice

National Equilibrium Price

The U.S. national average MSG rice price has risen through the early and mid-2000s, followed by the sharp drop during 2009-2011. The results show that the MSG rice price would move corresponding to trend until 2018 (figure B-44). In later years, the average price stabilizes around $17.58 per cwt. The MSG rice is forecasted to maintain a price premium over LG rice.

Total Planted Acres

The U.S. total MSG rice planted acres have not shown a statistically significant trend during 1985-2012. The forecast results indicate that the planted acres are projected to recover from the 2010-2012 reduction and that they would increase until 2018, averaging 0.80 million acres (figure B-45). For the rest of the forecast period, the total planted acres are projected to slowly decrease to reach 0.78 million acres in 2022.

At the regional level, the Far West and the Delta States will account for 99.0% of the total planted acres over the forecast period. In terms of the percentage changes, both regions are forecasted to show similar proportional changes.

Production

The U.S. MSG rice total production changes have been highly correlated to the total planted acres changes (correlation coefficient equals to 0.85, statistically significant at the 1% level). It implies that the total production is expected to recover from the recent reduction and stabilize during 2013-2022. During 2013-2022, the total production is projected to range between 45.8 and 50.2 million cwt (figure B-46). The Far West including California is forecasted to account for 76.0% of the total domestic production during 2013-2022, on average.

Demand

The U.S. MSG rice total demand is forecasted to continue to increase following the historical upward trend (figure B-47). Compared to the LG rice export demand (38.2%), the MSG rice export demand (40.2%) will take a larger portion out of the total demand during 2013-2022, on average.

Expected Net Returns (ENRs)

The changes of MSG rice ENRs in the two representative regions are presented in figure B-48. The forecasted market conditions and increasing expected yields are in favor of the MSG rice producers via increased ENRs. It implies that, in spite of increasing variable production costs, the regional producers' net returns are forecasted to increase during 2013-2022. The MSG rice ENRs in the Far West are projected to maintain a higher level than those in the Delta States because of the higher regional rice yields. However, physical and agronomic surroundings might be a high entry barrier preventing other producers from entering the MSG rice industry.

Dependence on program payments (MLG, DP and CCP) is extremely low during the forecast period. Projected prices keep staying at a high level, so there is little room for the program payments to be triggered.

Sorghum

National Equilibrium Price

The U.S. national average sorghum price has risen through the early and mid-2000s, reaching the record level of $6.90 per bushel in 2012. The forecast results show that the sorghum price would drop sharply in 2013 and then follow a downward trend (figure B-49). The downward trend is forecasted to have the national average sorghum price move below the trend level after 2018. The average sorghum price over 2013-2022 is projected to remain higher from the historical trend.

Total Planted Acres

The U.S. sorghum total planted acres have historically declined. The reduction of sorghum planted acres had been further accelerated during 2002-2004 and 2007-2010. The forecast results indicate that planted acres are projected to recover from the recent decline, averaging 2.48 million acres during 2013-2022 (figure B-50).

Over the forecast period, the Central Plains is forecasted to be the largest producer of sorghum, accounting for 46.6% of the total planted acres, on average. For the same period, the Southern Plains' share of the planted acres is forecasted to increase to 45.2% from the historical level of 36.2%. The increment is achieved at the cost of the reduction in other regions' planted acres from the historical level of 17.7% to the forecasted level of 8.2%.

Production

The forecast results indicate that the U.S sorghum total production would be stable, averaging 421.9 million bushels during 2013-2022 (figure B-51). During 2013-2022, the total production is projected to range between 398.6 and 426.3 million bushels. Also, the planted acres' concentration rates in the Central Plains and the Southern Plains are forecasted to further increase from a historical level of 80.5% to 91.5%.

Demand

The forecast results indicate that the U.S. sorghum total demand would rebound from the most recent 2 years decline (figure B-52). The sorghum feed demand is forecasted to temporarily increase from the 2011-2012 recession followed by moderate decrements in later years. The food demand is forecasted to, after the unusually large demand during 2008-2012, return to the historical level until 2014. For the rest of forecast periods, the food demand will increase from 62.7 million bushels in 2015 to 87.1 million bushels in 2022.

The largest demand changes are expected in the export demand sector. The U.S. sorghum exports, owing to the forecasted low prices, are forecasted to bounce from the record-low level during 2011-2012. During the forecast period, the export demand is projected to average 175.3 million bushels. Combined together, the share of food and export demand to increase by 9.54% and 3.94% compared to the historical shares during 1985-2012. In contrast, the feed demand share is forecasted to decrease.

Expected Net Returns (ENRs)

The changes in sorghum ENRs in the two representative regions are presented in figure B-53. The forecasted market conditions are likely to have disadvantages for the sorghum producers' ENRs whereas increasing expected yields are in favor of them. However, the larger effects of lower prices are expected to overwhelm those of increasing expected yields. As a result, declining of the regional sorghum ENRs are forecasted in the regions during 2013-2022.

The forecasted average sorghum ENRs are much higher in the Central Plains ($215.9 per acre) than in the Southern Plains ($107.0 per acre). The difference can be explained by the higher variable production costs and relatively lower yields in the Southern Plains.

Dependence on program payments (MLG, DP and CCP) is relatively higher compared to other crops' during the forecasting period. The lower sorghum ENRs in the Southern Plains lead the average dependence on policy payments (18.4%) to be larger than for the Central Plains (7.8%).

National Equilibrium Price

The U.S. national average soybean price has risen since 2006, reaching the record level of $14.30 per bushel in 2012. The forecast results show that the soybean price would rise continuously to $15.41 per bushel in 2015 (figure B-54). In later years, the soybean price is projected to decline and return to the trend level of $14.87 per bushel in 2019. The price is forecasted to be $14.12 per bushel in 2022.

Total Planted Acres

The U.S. soybean total planted acres had been reduced substantially to 64.7 million acres in 2007, decreased by 14.3% compared to 2006. Since then, total planted acres have again expanded to arrive at 77.2 million acres in 2012.

The forecast results indicate that the total planted acres would increase continuously to 86.8 million acres in 2022 (figure B-55). Unlike corn planted acres, no sudden or sharp drop in planted acres are forecasted for soybeans. That is, as the forecasted soybean prices are stable at high levels compared to corn price, corn and or other crop producers may have incentives to switch to soybeans.

At the regional level, the Corn Belt is forecasted to account for, on average, 42.8% of the total planted acres and remain as the largest production region during 2013-2022. The region’s average share in the planted acres is forecasted to decrease to 43.1% compared to the historical level of 49.0%. The reduced portion in the Corn Belt is expected to shift to the Central Plains and the South East where the average planted acres are projected to average 10.8 and 11.1 million acres during 2013-2022,

Production

The U.S. soybean total production is forecasted to recover from the most recent 2 years' drop to arrive at 3.33 billion bushels in 2013 (figure B-56). In later years, the total production is projected to increase continuously to 4 billion bushels in 2022. The continuous increments in planted acres and expected yields contribute to the production increases.

At the regional level, the Corn Belt is forecasted to account for 47.9% of the total production during 2013-2022, on average. The region's share in the total production forecasted to be lower than the historical average of 56.6%. The reduced portion in the Corn Belt is expected to shift to the Central Plains and South East where average production is projected to average 504.1 (13.7%) and 362.4 (9.8%) million bushels during 2013-2022.

Demand

The U.S. soybean total demand is forecasted to increase from 3.37 billion bushels in 2013 to 4.01 billion bushels in 2022 (figure B-57). The coefficient of variation shows the crushing (5.08%) and export demand (6.46%) remain stable over the forecast period.

The crushing demand is projected to remain the largest demand sector for U.S. soybeans. Positive real crushing margins, averaging $1.44 per bushel of soybeans, are forecasted to work to increase the derived demand for soybeans. Note that this baseline forecast is based on the assumption that no mandatory requirements for renewable fuels are imposed during the forecasting period, as mentioned earlier. In this sense, considering the effects of the mandates, they are supposed to affect the entire model including the soybean sector. The effects of such changes will be introduced in the Chapter VII.

The soybean export demand is forecasted to increase faster than crushing demand. The U.S. total exports are projected increase from 1.42 billion bushels in 2013 to 1.74 billion bushels in 2022.

Expected Net Returns (ENRs)

For illustrative purpose, the soybean ENRs changes in the Corn Belt, the Central Plains, the Lake States and the Northern Plains are provided. More detailed information on the regional ENRs changes is available in Appendix D.

The ENRs are forecasted to increase until 2016 and remain higher than the historical level (figure B-58). It implies that, in spite of increasing variable production costs, the regional soybean producers' net gains are forecasted to increase. The competition with corn might restrict the degree to which the planted acres of soybeans can expand. The observed differences of ENRs across regions are due to regional expected yields.

Dependence on program payments (MLG, DP and CCP) is forecasted to be similar across regions during 2013-2022 (1.81% in the Corn Belt, 1.96% in the Central

Plains, 2.24% in the Lake States, and 3.13% in the Northern Plains, on average). The forecasted soybean price is expected to prevent MLG and CCP from being triggered.

Soybean Meal

National Equilibrium Price

The U.S. national soybean meal price is forecasted to change in a different way from the soybean price. For soybean meal price, the historical upward trend is forecasted to last shorter than that for soybeans (figure B-59). After reaching $490.1 per short ton in 2013, the soybean meal price is projected to stabilize until 2016. In later years, the price is forecasted to decline to arrive at $460.3 per short ton in 2022.

Production

The U.S. soybean meal total production is highly correlated to the soybean crushing demand because a fixed proportion of soybean meal is produced from soybeans[10]. The forecast results indicate that the total production would move almost identically with the trend level. The projected production increases from 44.6 million short tons in 2013 to 51.8 million short tons in 2022 (figure B-60).

10 In this study, the conversion ratio (47.5 pounds of soybean meal out of 1 bushel of soybeans) is guided by the U.S. Soybean Export Council.

Demand

Historically, the U.S. soybean meal domestic demand has accounted for 78.9% of the total demand, on average. During the forecast period, the total domestic demand is forecasted to correspond to the historical trend (figure B-61). As mentioned earlier, the domestic consumption mostly depends on broiler feeding. Thus, external shocks in the U.S. poultry sector are likely to have direct and massive impacts on the domestic consumption. The U.S. soybean meal export demand is forecasted to increase steadily from 9.4 million short tons in 2013 to 10.9 million short tons in 2022. The gradually decreasing price is forecasted to increase the quantities exported.

Soybean Oil

National Equilibrium Price

The U.S. soybean oil price is forecasted to change in a different way from the price of soybean and soybean meal (figure B-62). The sharp drop in soybean oil price during 2011-2012 is forecasted to maintain until 2013. In later years, the soybean oil price is projected to change above the historical trend, reaching $0.54 per pound in 2022.

Production

The U.S. soybean oil total production is highly correlated to the soybean crushing demand because a fixed proportion of soybean oil is produced from soybeans[11].

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11 The conversion ratio (10.7 pounds of crude soybean oil out of 1 bushel of soybeans) is guided by the U.S. Soybean Export Council.

The forecast results indicate that the total production would move slightly above the historical trend (figure B-63). The projected production increases from 24.3 billion pounds in 2013 to 28.4 billion pounds in 2022.

Demand

Historically, the U.S. soybean oil domestic demand has accounted for 88.9% of the total demand, on average. During the forecast period, the soybean oil domestic demand is forecasted to move in line with the historical trend (figure B-64). The changes in substitutes' prices are not forecasted to substantially affect the domestic demand because the demand is inelastic with respect to the price of substitutes (0.158). In contrast, the U.S. soybean oil export demand is forecasted to decrease steadily from 2.2 billion pounds in 2013 to 2.0 billion pounds in 2022.

Wheat

National Equilibrium Price

The U.S. national average wheat price has risen since 2005 except for a sharp drop between 2008 and 2009. The forecast results indicate that the wheat price is projected to increase to $8.44 per bushel in 2013, followed by a radical drop to $6.83 per bushel in 2014 (figure B-65). For the rest of the forecast years, the wheat price is projected to slightly decline, averaging $6.06 per bushel.

Total Planted Acres

The U.S. wheat total planted acres had declined to 53.1 million acres in 2009. In the consecutive 3 years, the total planted acres have rebounded to 55.8 million acres in 2012. The forecast results indicate that the temporary expansion in recent years would increase slightly to reach 57.5 million acres in 2014 (figure B-66). In later years, continuous decrements are forecasted such that the total planted acres are projected to arrive at 54.0 million acres in 2022. When comparing the planted acres with those of corn and soybeans, it can be shown that a large part of the reduced wheat planted acres is forecasted to be allocated for soybeans and/or corn.

At the regional level, the three historically largest production regions (the Central Plains, the Northern Plains, and the Southern Plains) are forecasted to maintain their ranks.

Production

The U.S. wheat total production is forecasted to recover from the recent drop to arrive at 2.20 billion bushels in 2013 (figure B-67). In later years, the production is projected to be stable, averaging 2.31 billion bushels.

At the regional level, the Northern Plains is projected to produce 26.3% of the total production to remain as the largest production region during 2013-2022, on average. The Central Plains and the Southern Plains are forecasted to account for 31.3% of the total production, in total.

Demand

The U.S. wheat total demand is forecasted to stabilize, averaging 2.4 billion bushels during 2013-2022 (figure B-68). The coefficient of variation shows that food (1.75%) and export (1.54%) demand will remain stable. The high coefficient of variation value for the feed and residual demand (16.37%) is mainly due to difficulties in explaining the ‘residual’ demand. Compared to the historical share, the food demand is forecasted to have a larger portion (from 37.8% during 1985-2012 to 40.9% during 2013-2022) relative to export demand (from 48.3% during 1985-2012 to 42.7% during 2013-2022).

Expected Net Returns (ENRs)

For illustrative purpose, the changes in wheat ENRs in the Central Plains, the Northern Plains, and the Southern Plains are provided. More detailed information on regional wheat ENRs changes are is available in Appendix D.

The wheat ENRs are forecasted to remain high by 2013(figure B-69). As the wheat price is forecasted to stabilize at a relatively lower level in later years, the wheat ENRs are forecasted to be stable or slightly lower during 2014-2022. In addition, increasing variable production costs will reduce the ENRs across regions. Substantially lower ENRs in the Southern Plains stem from higher production costs and relatively lower expected yields.

Dependence on program payments (MLG, DP and CCP) is forecasted to be relatively higher than for the other crops. The dependence is expected to vary across regions (9.6% in the Central Plains, 8.3% in the Northern Plains, and 12.1% in the Southern Plains, on average).

Peanuts

National Equilibrium Price

The U.S. national average peanut price had remained low during the early- and mid-2000s because of the elimination of marketing quota and support programs in 2002. The peanut price is forecasted to keep rising to $778.6 per ton in 2014 (figure B-70). In later years, the peanut price is projected to continuously decline with a spike during 2017-2018. The projected peanut price is forecasted to reach $657.6 per ton in 2022.

Total Planted Acres

The U.S. peanut total planted acres have reduced with a number of fluctuations. Consequently, the total planted acres are projected to change from 1.16 million acres in 2013 to 1.03 million acres in 2022 (figure B-71).

At the regional level, the South East including Georgia is forecasted to play a major role in the total planted acres. The region's share during the forecast period (81.1%) is forecasted to be larger than the historical average (76.1%).

Production

The U.S. peanut total production is forecasted to stabilize, averaging 3.60 billion pounds during 2013-2022 (figure B-72). The average production is much lower than the

2012 record of 6.74 billion pounds. The gradually lowered peanut price is forecasted to contribute to stabilizing the peanut production during 2013-2022. The South East is forecasted to account for 85.5% of the total production during 2013-2022, on average.

Demand

The U.S. peanut total demand is forecasted to average 3.5 billion pounds during 2013-2022 (figure B-73). The forecasted demand is considerably lower than the historical demand or the last decade's demand which averaged 4.08 and 4.31 billion pounds.

During the forecast period, the share of food demand is projected to increase from historical 56.8% to 68.2%. The change is achieved at the cost of reduced crushing demand (from historical 16.2% to forecasted 10.4%) and export demand (from historical 17.3% to forecasted 5.3%) shares.

Expected Net Returns (ENRs)

The changes of peanut ENRs in South East are summarized in figure B-74. More detailed information on the regional peanut ENRs changes is available in Appendix D.

The ENRs are forecasted to decrease with a number of up-and-downs during 2013-2022. The changes of peanut ENRs are closely correlated with the forecasted price changes. Increasing expected yields mitigate the effects of the declining price. Dependence on program payments (MLG, DP and CCP) is forecasted to average 7.02%.

Ethanol

Equilibrium Price

The ethanol price in Omaha, Nebraska is used as the representative ethanol price in this study. The Renewable Fuel Standard 2 (RFS2) has supported the ethanol price higher from the historical stand. Assuming that the regulation were to be no more in effect after 2012, the ethanol price is forecasted to rise until 2013 followed by a declining trend in later years.

The forecast results show that the representative ethanol price would reach $2.84 per gallon in 2013 and keep falling down to $2.44 per gallon in 2022 (figure B-75). Given that ethanol and petroleum are substitutes, the changes in the exogenous crude oil prices can affect the forecasted ethanol price.

Production

The U.S. ethanol total production is forecasted to sharply decrease in 2013 (figure B-76). The reduction is mainly because of reduced demand coming from the strong assumption of the absence of the RFS2. The ethanol production is forecasted to continuously increase after 2014. In 2022, the domestic production is projected to be 14.9 billion gallons and marginally meet the mandatory level of 15.0 billion gallons.

Demand

The forecast results show that the U.S. ethanol total demand would increase continuously during 2014-2022 (figure B-77). The assumed absence of the RFS2 drastically reduced the domestic demand by 15.5%. After the reduction in 2013, the domestic ethanol demand is forecasted to increase continuously to reach a projected 14.84 billion gallons in 2022. The existing problem of 'blending wall' is not considered in this study and might restrict the domestic demand.

Regarding the net export side, a couple of things are to be mentioned. First, the radical change in ethanol net exports during the mid-2000s is due to the 'splash-and-dash' beginning in 2006 (increasing imports for re-exports) and the 'closing a loophole' in 2008. Second, tightened production and reduced beginning stocks are forecasted to shift the U.S. from a net exporter to a net importer during 2013-2020. The dependence on net imports is tiny relative to domestic production and forecasted to be smaller over time.

Operating Margins

The U.S. ethanol production operating margins evaluated in real terms have decreased over time for both dry milling (DM) and wet milling (WM). Especially, the higher corn prices during the mid- and late- 2000s deteriorated the operating margins. The forecast results show that, under the forecasted corn and ethanol prices, the ethanol operating margins for both milling types are forecasted to recover from the record low level in 2012 ($0.10 and $0.25 per gallon for DM and WM, figure B-78). The operating margins for DM and WM are forecasted to average $0.90 and $1.02 per gallon during 2013-2022. The margins are forecasted to gradually decline such that DM and WM margins will change from $1.21 and $1.35 per gallon in 2013 to $0.70 and $0.83 dollar per gallon in 2022.

Biodiesel

Equilibrium Price

The RFS2 has supported the U.S. biodiesel price higher from the historical stand. Assuming that the regulations were not to be in effect after 2012, the biodiesel price is forecasted to rise until 2013 and lower during 2014-2022 (figure B-79). The forecast results show that the biodiesel price would be $4.74 per gallon in 2013 and keep falling down to $3.98 per gallon in 2017. In later years, the price is forecasted to stabilize averaging $4.06 per gallon during 2018-2022.

Production

The U.S. biodiesel total production is forecasted to largely decrease between 2012 and 2013 (figure B-80). The assumed absence of the RFS2 drastically reduced the domestic production by 42.2%. As differences between the historical production and the mandate level are much larger for biodiesel than ethanol, the assumption of 'no RFS2' has larger effects on the magnitudes of decreases in quantity demanded.

The biodiesel production is forecasted to keep increasing after 2013. In 2022, the biodiesel production is projected to be 0.97 billion gallons which is far below the mandated level of 1.28 billion gallons.

Demand

The forecast results show that the domestic biodiesel demand would increase continuously during 2013-2022 (figure B-81). The assumed 'absence' of biofuels mandates drastically reduced the U.S. domestic demand by 47.8% during 2012-2013. After 2013, the domestic demand is forecasted to increase continuously to reach 0.98 billion gallons in 2022.

Regarding the net export side, the U.S. is forecasted to export less biodiesel after 2013. It is because annual average increment in the domestic biodiesel demand (8.95%) is larger than that of production (6.30%), leaving a smaller room for exports. As a result, the U.S. is forecasted to be a net importer in 2021.

Operating Margins

The historical biodiesel operating margins, evaluated in real terms, have fluctuated greatly during 2001-2012. Especially, a large variation of the soybean oil price since the late 1990s has heavily affected the operating margins. Under the forecasted soybean oil and biodiesel prices, the operating margins are forecasted to increase $2.37 per gallon in 2013 (figure B-82). The operating margins are forecasted to deteriorate during 2014-2022. The expected changes stem from the fact that the soybean oil price is forecasted to keep going up whereas the biodiesel price is forecasted to remain relatively stable. As a result, after 2019, some biodiesel producers might be faced with negative operating margins.

Comparing the Forecast Result with Other Studies

Comparing the forecasting results in this study with those of similar and relevant analyses can be used to evaluate the model's plausibility. Taking model structure and range of analysis into account, the latest projections provided by the USDA (2014) and Food and Agricultural Policy Research Institute (FAPRI 2013, 2014) are selected for comparison. A couple of things need to be mentioned prior to more detailed comparisons. First, FAPRI (2014) depends on the assumption of the 2014 Farm Bill's being in effect whereas the baseline forecast in this study and USDA (2014) assume that the 2008 Farm Bill will maintain throughout the forecast period. That is, a direct comparison between the three forecast results cannot be made. Therefore, the second latest FAPRI projection (FAPRI 2013) which assumes the continuation of the 2008 Farm Bill is utilized for the comparison. Second, the results of this study and FAPRI (2014) are compared in Chapter VIII.

The major assumptions in each of the three projections are summarized in tables C-97 and C-98. Economic growth assumptions are expected to affect the demand in the ROW. The larger the assumed growth rate, the larger the world demand is likely to be induced. The assumption regarding oil prices can affect the forecast results in a number of ways, including a lager demand for biofuels (and inputs) and higher production costs. As discussed earlier, the value of the U.S. currency affects the export demand. The crude oil price assumption is relevant to such variables as production costs and biofuel demand. Unlike this study, USDA (2014) and FAPRI (2013, 2014) have incorporated the global market (international trade) and the U.S. livestock sector into their models. The macroeconomic conditions related to the global market can affect the export demand and import demand for crops and other sectors. Likewise, allowing the livestock sector to be endogenous may affect the forecast result in that livestock producers may adjust their production decision based on the market conditions in the mid- or long-run. This study does not encompass some of agricultural policies considered in other two projections, e.g. CRP and ACRE. The range of analyzed commodities differs by studies, which is expected to affect the forecast results.

A comparison between the forecast results for the three studies is provided in Table C-99. In the baseline forecast comparison, it is to be noted that the forecast results of this study are more similar to those by FAPRI than USDA, and that, with some exceptions, the average percentage differences are smaller than 10%. With an exception of oats, the forecasted prices in this study are higher than those by USDA and FAPRI, which could be due to several reasons. First and foremost, exogeneity or endogeneity of international trade is likely to be a source of the differences. For such crops heavily dependent on the global market as soybeans and cotton, the behavior of other major trading countries matter. When soybean price goes up, Brazil and Argentina can expand their production resulting in lower prices. Likewise, taking India (exporter) and China (importer) into the model could substantially affect the U.S. cotton export demand. Second, expected yields estimated in this study are generally lower, which can work to reduce the magnitude of total production and supply. Third, the magnitudes of beginning/ending stocks and/or imports differ across the studies. For such crops as oats and sorghum, the magnitudes affect the size of total supply and/or demand. Forth, the competition between crops specified in each study could be different from one another. Fifth, inclusion of certain farm programs and estimated production costs can affect the magnitudes of ENRs which are important determinants of planting decisions.

CHAPTER VI

FORECAST RESULTS: EXCHANGE RATE CHANGE SCENARIOS

Description of the Exchange Rate Change Specifications

The exchange rate change scenarios differ from the baseline in that the U.S. agricultural trade-weighted exchange rates are appreciated or depreciated during the forecast period, other things remaining unchanged. The appreciation of the U.S. dollar implies a stronger U.S. dollar which is expected to reduce import demand by the U.S. trading partners, when other things remain the same. Likewise, the depreciation or devaluation of the U.S. currency implies a weaker value for the U.S. dollar which is expected to increase import demand for U.S. commodities.

A crop's equilibrium price is expected to decrease and fall down (increase and go up) when exogenously assuming the appreciation (depreciation). As the price change can affect the crop's demand sectors other than exports, the changes in total demand should be empirically evaluated. Also, the changes in price and demand are supposed to affect the crop's ENRs and planted acres. In the entire system, simultaneous interactions between multiple markets may lead to different impacts of the exchange rate by crop. To analyze the effects, this study's model has the U.S. agricultural-trade weighted real exchange rates change during 2013-2022. For the analytical sake, the appreciation and depreciation scenarios in this study assume that value of the U.S. currency become higher and lower by 10% compared to those in the baseline scenario.

Forecast Summary

Corn

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to a lower national equilibrium corn price during 2013-2022 (figure B-83). Depreciation of the U.S. dollar is forecasted to increase corn price than the baseline price. The appreciation and depreciation by 10% during 2013-2022 lower and raise the corn price by 5.48% and 5.37% on average.

Total Planted Acres

The forecast results indicate that the U.S. corn total planted acres would decrease (0.37%, on average) and increase (0.35%, on average) under the appreciation and depreciation scenarios (figure B-84). Even if the strengthened U.S. dollar causes the lower corn price and thus lowers the corn ENRs, a larger reduction in the competing crops' ENRs may provide an incentive for corn producers to maintain or even increase planted acres. The identical logic can be applied to the depreciation scenario.

Production

The forecast results indicate that the U.S. corn total production would decrease (0.37%, on average) and increase (0.35%, on average) under the appreciation and depreciation scenario during 2013-2022 (figure B-85). Because the estimates for corn harvest acres and corn expected yields are unchanged, the percentage changes in the production depend solely on changes in the planted acres.

Demand

Under the appreciation and depreciation scenarios, the U.S. corn export demand decreases by 4.28% and increases by 4.30% during 2013-2022 on average (figure B-86). The price changes affect other corn demand sectors in the opposite direction such that the changes in total demand are less sensitive. For example, under the appreciation scenario, the lower corn price leads the corn demand for feed, food and industry, and energy production to increase by 1.68%, 0.65%, and 0.62% during 2013-2022. As a result, in spite of the decreased export demand, the corn total demand is forecasted to increase by 0.34% during 2013-2022, on average.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the corn ENRs in the Corn Belt, the Central Plains, and the North East is compared. More detailed information on the regional corn ENRs changes is available in Appendix D.

Changes in the corn ENRs under the exchange rate change scenarios are in line with theoretical expectations. The strengthened and the weakened U.S. dollar by 10% are forecasted to decrease and increase the average regional corn ENRs by 8.83% and 8.66% during 2013-2022 (figure B-87).

Barley

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to the lower national equilibrium barley price during 2013-2022 (figure B-88). Depreciation of the U.S. dollar is forecasted to move the barley price higher than the baseline price. The appreciation and depreciation by 10% during 2013-2022 are forecasted to reduce and raise the price by 6.07% and 6.10. Under the exchange rate change scenarios, the barley price is forecasted to continuously rise.

Total Planted Acres

The forecast results indicate that the U.S. barley total planted acres would decrease (0.60%, on average) and increase (0.60%, on average) under the appreciation and depreciation scenario during 2013-2022 on average (figure B-89). Under the exchange rate change scenarios, total planted acres are forecasted to slowly decline, as is forecasted under the baseline.

Production

The forecast results indicate that the U.S. barley total production would decrease (0.52%, on average) and increase (0.51%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-90). Because the estimates for barley harvested acres and expected yields are unchanged, the changes in the production solely depend on the changes in planted acres.

Demand

Under the appreciation and depreciation scenarios, the U.S. barley export demand is forecasted to decrease by 21.3% and increases by 21.3% during 2013-2022, on average (figure B-91). The sensitive changes in the export demand come from the fact that the U.S. plays a minor role in the international barley market, and that barley exports are sensitively affected by external changes. The price changes affect other barley demand sectors in opposite direction. For example, the lower barley price is expected to increase the food and feed demand when other things remain unchanged. As the export demand accounts for a small portion out of total demand (6.15% during 1985-2012, on average), the exchange rate changes can have limited impacts on the total demand.

Expected Net Returns (ENRs)

A simple average of the barley ENRs in the Far West and the Northern Plains under the exchange rate change scenarios is presented in figure B-92. Under the appreciation and depreciation scenarios, the ENRs are forecasted to continuously increase. The 10% appreciation and depreciation of the U.S. dollar are forecasted to decrease and increase the average ENRs by 8.37% and 8.41% during 2013-2022 on average. The changes in the total planted acres indicate that the changes of barley ENRs may not provide producers with sufficient incentives to expand or reduce planted acres.

Cotton

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to the lower national equilibrium cotton price during 2013-2022 (figure B-93). Depreciation of the U.S. dollar is forecasted to increase the price than the baseline price. The appreciation and depreciation by 10% during 2013-2022 are forecasted to lower and raise the price by 8.86% and 9.62% on average. A heavier dependence on exports leads the U.S. cotton price to respond to exchange rate changes more sensitively compared to other crops.

Total Planted Acres

The forecast results indicate that the U.S. total cotton planted acres would decrease (1.38%, on average) and increase (1.16%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-94).

Production

The forecast results indicate that the U.S. cotton total production would decrease (1.53%, on average) and increase (1.24%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-95). Because the estimates for cotton harvested acres and expected yields are unchanged, the changes in production depend solely on changes of planted acres. As the cotton expected yields increase over the forecast period, the percentage changes of production are larger than planted acres.

Demand

Under the appreciation and depreciation scenarios, the U.S. cotton export demand is forecasted to decrease by 3.44% and increases by 3.28% during 2013-2022 on average (figure B-96). Under the exchange rate change scenarios, the cotton export demand is forecasted to account for 72.6%~77.6% of the total demand during 2013-2022, on average. In contrast, the U.S. domestic milling demand is forecasted to decrease and remain relatively insensitive to the exchange rate changes.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of ENRs in the Delta States, the Far West, the South East, and the Southern Plains is compared. More detailed information on the regional cotton ENRs changes is available in Appendix D.

Changes in the average cotton ENRs under the exchange rate scenarios are in line with theoretical expectations. The strengthened and the weakened U.S. dollar by 10% are forecasted to decrease and increase the average regional cotton ENRs by 18.17% and 19.78% (figure B-97). As discussed earlier, the changes in the cotton ENRs are not fully transmitted to producers' planting decisions.

Oats

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to the lower national equilibrium oat price during 2013-2022 (figure B-98). Depreciation of the U.S. dollar is forecasted to have the price higher than the baseline price. The appreciation and depreciation by 10% during 2013-2022 are forecasted lower and raise the price by 5.01% and 4.93% on average. A tiny dependence on exports leads the U.S. oat prices to be relatively insensitive to the exchange rate changes.

Total Planted Acres

The forecast results indicate that the U.S. oat total planted acres would decrease (0.43%, on average) and increase (0.36%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-99). As the planted acres are inelastic with respect to the changes of ENRs, the exchange rate changes have limited impacts on oat producers' planting decisions.

Production

The forecast results indicate that the U.S. oat total production would decrease (0.33%, on average) and increase (0.28%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-100). Smaller increments in the expected yields and low harvesting rate have changes of the production smaller than those of the planted acres.

Demand

Under the appreciation and depreciation scenarios, the U.S. oat export demand is forecasted to decrease by 9.34% and increases by 10.33% during 2013-2022, on average (figure B-101). The sensitivity of the export demand with respect to exchange rate changes is due to the country's playing a tiny role in the global market. As the export demand accounts for only 0.74% of total demand during 1985-2012, the changes caused by the exchange rate changes cannot have substantial impacts on the total demand.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of ENRs in the Far West, the Lake States, the Northern Plains, and the Southern Plains is compared. More detailed information on the regional oat ENRs changes is available in Appendix D.

Changes in the oat ENRs under the exchange rate scenarios are in line with theoretical expectations. The strengthened and the weakened U.S. dollar by 10% are forecasted to decrease and increase the average regional ENRs by 12.85% and 12.64% during 2013-2022 on average (figure B-102).

Long Grain (LG) Rice

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to the lower national equilibrium LG rice price during 2013-2022 (figure B-103). Depreciation of the U.S. dollar is forecasted to move the price higher than the baseline price. The appreciation and depreciation by 10% during 2013-2022 are forecasted to lower and raise the price by 0.91% and 2.02% on average. In spite of heavy dependence on exports, the LG rice prices are forecasted to be relatively insensitive to the appreciation. Depreciation of the

U.S. dollar is forecasted to have a larger impact on the price compared to the appreciation. The weakened U.S. dollar is forecasted to have lingering effects such that the LG rice prices may remain at a higher level by 2016.

Total Planted Acres

The forecast results indicate that the U.S. LG rice total planted acres would decrease (0.22%, on average) and increase (0.48%, on average) under the 10% appreciation and depreciation scenarios during 2013-2022 (figure B-104). The planted acres' being inelastic with respect to changes in the ENRs and the presence of entry barriers partially insulates the impacts caused by the exchange rate changes on changes of the planted acres.

Production

The forecast results indicate that the U.S. LG rice total would decrease (0.25%, on average) and increase (0.57%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-105). As the LG rice expected yields continuously increase over time, changes in the production are forecasted to be larger than those for the planted acres.

Demand

The forecast results show that the depreciation would have larger impacts on the total demand than the appreciation. The strengthened and the weakened U.S. dollar by

10% are forecasted to decrease and increase the LG rice total demand by 0.27% and 0.45% during 2013-2022 on average (figure B-106). Under the appreciation and depreciation scenarios, the export demand is forecasted to decrease by 0.88% and increases by 0.20% during 2013-2022, on average.

Expected Net Returns (ENRs)

For illustrative purpose, the LG rice ENRs in the Delta States are compared. Changes in the ENRs under the exchange rate scenarios are in line with theoretical expectations. The strengthened and the weakened U.S. dollar by 10% is forecasted to decrease and increase the average regional ENRs only by 1.33% and 2.96% during 2013-2022 (figure B-107). As discussed earlier, the lingering effect of the depreciation during 2015-2016 is reflected in the region ENRs.

Medium/Short Grain (MSG) Rice

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to the lower national equilibrium MSG rice price during 2013-2022. Depreciation of the U.S. dollar is forecasted to have the MSG rice price higher than the baseline price. The appreciation and depreciation by 10% during 2013-2022 are forecasted to lower and raise the price by 0.34% and 5.27% on average (figure B-108). As MSG rice is less dependent on exports compared to LG rice, the MSG rice price is forecasted to be relatively insensitive to the exchange rate changes. The depreciation has a larger impact on the price than the appreciation, when compared to the LG rice case.

Total Planted Acres

The forecast results indicate that the U.S. MSG rice total planted acres would be almost independent of the appreciation, decreasing by 0.17% during 2013-2022, on average (figure B-109). In contrast, the depreciation of the U.S. dollar is forecasted to have larger direct impacts on the planted acres, increasing them by 2.81% during 2013-2022, on average. The presence of entry barriers in the rice industry prevents the planted acres from fully adjusting to the changes in price and ENRs.

Production

The forecast results indicate that the U.S. MSG rice total production would decrease (0.14%, on average) and increase (2.40%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-110). An upward trend in the expected yields mitigates changes in the production under the appreciation scenario and accelerates the changes under the depreciation scenario.

Demand

Under the strengthened and the weakened U.S. dollar scenarios, the U.S. MSG rice total demand is forecasted to decrease and increase by 0.40% and 1.61% during 2013-2022 on average (figure B-111). Even if the historical dependence on exports is lower (37.0%) compared to LG rice, the exchange rate changes are forecasted to have larger impacts on exports and total demand.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the MSG rice ENRs in the Delta States and the Far West is compared. Changes in the average ENRs under the exchange rate scenarios are in line with theoretical expectations. The strengthened and the weakened U.S. dollar by 10% are forecasted to decrease and increase the average regional MSG rice ENRs only by 0.47% and 7.25% during 2013-2022 (figure B-112). As shown earlier, the depreciation will have larger impacts on the regional ENRs than the appreciation.

Sorghum

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to the lower national equilibrium sorghum price during 2013-2022. Depreciation of the U.S. dollar is forecasted to have the sorghum price higher than the baseline price. The appreciation and depreciation by 10% during 2013-2022 are forecasted to lower and raise the price by 5.16% and 4.97% on average (figure B-113).

Total Planted Acres

The forecast results indicate that the U.S. sorghum total planted acres would be almost independent of the exchange rate changes. Under the strengthened and the weakened U.S. dollar scenarios, the total planted acres are projected to decrease and increase by 0.15% and 0.11% during 2013-2022 on average (figure B-114).

Production

The forecast results indicate that the U.S. sorghum total production would decrease (0.11%, on average) and increase (0.08%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-115). In spite of the exchange rate changes, changes of the planted acres are forecasted to be a main determinant of the production.

Demand

Under the strengthened and the weakened U.S. dollar scenarios, the U.S. sorghum total demand is forecasted to decrease and increase by 0.11% and 0.08% during 2013-2022 on average (figure B-116). Because of the country being a dominant exporter in the global sorghum market, the exchange rate changes may have relatively small impacts on the export demand. With the appreciation and depreciation of U.S. dollar, the export demand is forecasted to decrease and increase by 1.53% and 1.69% during 2013-2022 on average.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the sorghum ENRs in the Central Plains and the Southern Plains is compared. Changes in the average ENRs under the exchange rate scenarios are in line with theoretical expectations. Also, the impacts of the strengthened and the weakened U.S. dollar are forecasted to be almost directly transmitted to the regional ENRs. The appreciation and depreciation of U.S. dollar by 10% are forecasted to decrease and increase the average ENRs by 9.39% and 9.04% during 2013-2022 (figure B-117).

Soybeans

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to the lower national equilibrium soybean price during 2013-2022 (figure B-118). Depreciation of the U.S. dollar is forecasted to have the soybean price higher than the baseline price. The comparison shows that soybeans are one of the commodities most sensitive to exchange rate changes. The appreciation and depreciation scenarios during 2013-2022 are forecasted to lower and raise the price by 11.27% and 11.69% on average.

Total Planted Acres

The forecast results indicate that the changes on U.S. soybean total planted acres would be much smaller than the changes of prices and ENRs (figure B-119). Under the strengthened and the weakened U.S. dollar scenarios, the U.S. soybean total planted acres are projected to decrease and increase by 0.33% and 0.28% during 2013-2022 on average.

Production

The forecast results indicate that the U.S. soybean total production would decrease (0.29%, on average) and increase (0.24%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-120).

Demand

Under the strengthened and the weakened U.S. dollar scenarios, the U.S. soybean total demand would decrease and increase by 0.29% and 0.22% during 2013-2022 on average (figure B-121). The exchange rate changes are forecasted to have relatively larger impacts on export demand by decreasing and increasing the demand by 2.31% and 2.31% on average.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the soybean ENRs in the Corn Belt, the Central Plains, the Lake States, and the Northern Plains is compared. Changes in the average ENRs under the exchange rate scenarios are in line with theoretical expectations. Also, the impacts of the strengthened and the weakened U.S. dollar are forecasted to be directly transmitted to the regional ENRs (figure B-122). The appreciation and depreciation of U.S. dollar by 10% are forecasted to decrease and increase the average ENRs by 14.00% and 14.52% during 2013-2022 on average.

Soybean Meal

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to the lower national equilibrium soybean meal price during 2013-2022 (figure B-123). Depreciation of the U.S. dollar is forecasted to have the soybean meal price higher than the baseline price. Also, the comparison shows that the soybean meal is one of the commodities most sensitive to exchange rate changes. The appreciation and depreciation by 10% during 2013-2022 are forecasted to lower and raise the price by 14.59% and 13.89% on average,.

Production

The forecast results indicate that the U.S. soybean meal total production would decrease (0.19%, on average) and increase (0.28%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-124). The tiny changes come from the fact that the soybean meal production is mainly determined by the soybean crush demand rather than the exchange rate changes.

Demand

Under the strengthened and the weakened U.S. dollar scenarios, the U.S. soybean meal total demand is forecasted to decrease and increase by 0.19% and 0.28% during 2013-2022 on average (figure B-125). The exchange rate changes are forecasted to have relatively larger impacts on the export demand by decreasing and increasing the demand by 3.92% and 3.24% on average. The differences may be partially due to a relatively small portion of the export demand during 1985-2012 (21.1%).

Soybean Oil

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to the lower national equilibrium soybean oil price during 2013-2022 (figure B-126). Depreciation of the U.S. dollar is forecasted to move the soybean oil price higher than the baseline price. The small impacts of the exchange rate changes on the soybean oil price are in contrast to the soybean meal case. The appreciation and depreciation by 10% during 2013-2022 are forecasted to lower and raise the price by 1.84% and 2.31% on average.

Production

The forecast results indicate that the U.S. total soybean oil production would decrease (0.20%, on average) and increase (0.30%, on average) under the appreciation and depreciation scenarios (figure B-127). The small changes come from the fact that soybean oil production is mainly determined by the soybean crushing demand rather than the exchange rate changes.

Demand

Under the strengthened and the weakened U.S. dollar scenarios, the U.S. soybean oil total demand would decrease and increase by 0.18% and 0.27% during 2013-2022 on average (figure B-128). The exchange rate changes are forecasted to have relatively larger impacts on the export demand by decreasing and increasing the demand by 1.29% and 0.88% on average. The different impacts may be partially attributed to a relatively small portion of the export demand during 1985-2012 (11.1%).

Wheat

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to the lower national equilibrium wheat price during 2013-2022 (figure B-129). Depreciation of the U.S. dollar would move the wheat price higher than the baseline. Also, the comparison shows that wheat is among the commodities sensitive to the exchange rate changes. The appreciation and depreciation by 10% during 2013-2022 are forecasted to lower and raise the wheat price by 12.43% and 13.70% on average.

Total Planted Acres

The forecast results indicate that the U.S. wheat total planted acres would be substantially insensitive to the changes of wheat price during 2013-2022 (figure B-130). Under the strengthened and the weakened U.S. dollar by 10%, the wheat planted acres are projected to decrease by 1.76% and increase 1.47% during 2013-2022 on average,.

Production

The forecast results indicate that the U.S. wheat total production would decrease (1.57%, on average) and increase (1.32%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-131). As the estimates for the wheat harvested acres and expected yields remain unchanged during the forecast period, changes in wheat production is similar with the changes in planted acres.

Demand

Under the strengthened and the weakened U.S. dollar scenarios, the U.S. wheat total demand is forecasted to decrease by 1.12% and increase by 0.94% during 2013-2022 on average (figure B-132). The exchange rate changes are forecasted to have relatively larger impacts on the export demand by decreasing and increasing the demand by 6.10% and 5.85% on average.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the wheat ENRs in the Central Plains, the Northern Plains, and the Southern Plains is compared. Changes in the average ENRs under the exchange rate scenarios are in line with theoretical expectations. Also, the effects of the strengthened and weakened U.S. dollar by 10% are forecasted to be directly transmitted to the regional ENRs (figure B-133). The appreciation and depreciation of U.S. dollar by 10% decrease and increase the average ENRs by 20.34% and 22.42% during 2013-2022 on average.

Peanuts

National Equilibrium Price

Compared to the baseline, the strengthened U.S. dollar leads to lower national equilibrium peanut prices during 2013-2022 (figure B-134). Depreciation of the U.S. dollar is forecasted to have the peanut price higher than the baseline price. The appreciation and depreciation by 10% during 2013-2022 are forecasted to lower and raise the price by 5.59% and 5.52% on average.

Total Planted Acres

The forecast results indicate that the U.S. peanut total planted acres would respond insensitively to the price changes (figure B-135). Under the strengthened and weakened U.S. dollar scenarios, the total planted acres are projected to decrease by 0.10% and increase by 0.07% during 2013-2022 on average. The tiny changes in the planted acres come from the fact that the planted acres of peanuts are mainly determined by the previously planted acres rather than the ENRs as shown in Chapter IV.

Production

The forecast results indicate that the U.S. peanut total production would decrease (0.09%, on average) and increase (0.06%, on average) under the appreciation and depreciation scenario during 2013-2022 on average (figure B-136).

Demand

Under the strengthened and weakened U.S. dollar scenarios, the U.S. peanut total demand is forecasted to decrease by 0.06% and increase by 0.04% during 2013-2022 on average (figure B-137). The exchange rate changes are forecasted to have larger impacts on the export demand by decreasing and increasing the demand by 16.58% and 16.97% during 2013-2022 on average. The historically small shares for the export demand (13.3%, on average) mitigate the impacts of the exchange rate changes on total demand.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the peanut ENRs in the South East is compared. Changes in the average ENRs under the exchange rate scenarios are in line with theoretical expectations. The impacts of the strengthened and weakened U.S. dollar by 10% are forecasted to substantially affect the regional ENRs (figure B-138). The appreciation and depreciation of U.S. dollar by 10% decrease and increase the average ENRs by 9.53% and 9.40% during 2013-2022.

Ethanol

National Equilibrium Price

Compared to the baseline, the strengthened and weakened U.S. dollar by 10% would only slightly affect the representative ethanol price in Omaha, Nebraska (figure B-139). The appreciation and depreciation by 10% during 2013-2022 are forecasted to lower and raise the price by 1.66% and 1.62% during 2013-2022 on average.

Production

The forecast results indicate that the U.S. ethanol total production would decrease (0.59%, on average) and increase (0.58%, on average) under the appreciation and depreciation scenario during 2013-2022 (figure B-140). The tiny changes come from the fact that the forecasted small changes in the ethanol price fail to substantially change the ethanol processing margins, when other things remain unchanged.

Demand

Under the strengthened and weakened U.S. dollar scenarios, the U.S. ethanol total demand would decrease and increase by 0.55% and 0.56% during 2013-2022 on average (figure B-141). The exchange rate changes are forecasted to have much larger impacts on the net export demand by decreasing and increasing the demand by 23.4% and 23.8% during 2013-2022 on average.

Operating Margins

The forecast results show that the strengthened and weakened U.S. dollars by 10% would mot exert strong impacts on the ethanol operating margins (figures B-142 and B-143). The 10% appreciation is forecasted to improve the dry milling (DM) and wet milling (WM) operating margins by 3.32% and 3.46% during 2013-2022 on average. Similarly, under the 10% depreciation scenario, the dry milling (DM) and wet milling (WM) operating margins are forecasted to deteriorate by 3.25% and 3.25% on average,.

Biodiesel

National Equilibrium Price

Compared to the baseline, the strengthened and weakened U.S. dollar by 10% are not forecasted to substantially affect the biodiesel prices (figure B-144). The appreciation and depreciation by 10% during 2013-2022 are forecasted to lower and raise the price by 1.35% and 1.73% on average.

Production

The forecast results indicate that the U.S. biodiesel total production would decrease (0.03%, on average) and increase (0.03%, on average) under the appreciation and depreciation scenarios during 2013-2022 (figure B-145). The tiny changes come from the fact that the small changes in biodiesel and soybean oil prices fail to substantially change the biodiesel operating margins, when other things remain unchanged.

Demand

Under the strengthened and weakened U.S. dollar scenarios, the U.S. biodiesel total demand would decrease and increase by 0.05% and 0.07% on average (figure B-146). The exchange rate changes are forecasted to have larger impacts on the net export demand by decreasing and increasing the demand by 1.44% and 2.00% on average.

Operating Margins

Both strengthened and weakened U.S. dollars by 10% are not forecasted to exert strong impacts on the biodiesel operating margins (figure B-147). The 10% appreciation is forecasted to improve the operating margins by 2.79% during 2013-2022, on average. Similarly, the 10% depreciation forecasted to deteriorate the operating margins by 3.09% during 2013-2022, on average.

Measurements of Changes in Welfare and Policy Implications

As discussed earlier, depreciation of the U.S. dollar is expected to increase the producer surplus whereas the U.S. consumers will suffer from welfare loss. In contrast, the stronger U.S. currency will benefit the domestic consumers at the cost of producer surplus. The welfare changes under the exchange rate changes are summarized in table

C-100[12, 13]. The signs of welfare changes are in line with theoretical expectations. In terms of magnitude, the depreciation is forecasted to have stronger effects on the domestic welfare than the appreciation.

For cotton, the magnitudes of the PS changes are much larger than CS changes. This result comes from heavy dependence on the export demand or a small share of the domestic demand. Under the baseline, only a quarter of the cotton total demand is forecasted to be domestically consumed. The CS loss under the depreciation or CS gain under the appreciation will be largely transmitted to the foreign consumers.

When measuring the welfare changes for oats, soybeans, and soybean meal sectors, the magnitudes of the CS changes are larger than PS changes. For oats, the unexpected result is due to the presence of the excess demand, which over-evaluates the CS loss due to the external shocks. In the soybean sector, the CS loss is larger than what it actually would have been because the change does not fully capture the CS changes in the crushing demand. As the expected changes of crushing margins for soybean processors are fully captured in the approximation procedure, the absolute sizes of CS changes are larger than what they would have been. For soybean meal, the number of broilers assumed to be exogenous can cause the CS changes to be over-evaluated. If the broiler market was endogenous, the growers would have an incentive to adjust the size of broilers when soybean meal prices increased.

[12] Note that the welfare measurements do not include biofuel markets, and are confined to the crop of interest in this study.
[13] The welfare measurements are approximated based on the total supply and total demand.

An additional thing to mention is that a crop demand's heavier dependence on the export demand does not necessarily imply the higher sensitiveness to the exchange rate changes. The point can be accounted for because this model does not incorporate the trade-flows with the ROW and the presence of exchange rate disconnection puzzle (De Grauwe and Grimaldi 2004; Devereux and Engel 2002; Berman, Martin, and Mayer 2012).

In spite of the substantially large expected impacts of the exchange rate changes on export demand, the U.S. government has relatively few policy tools to balance the impacts on the agricultural sector. First, government is unlikely to affect the exchange rates determination behaviors to achieve a specific aim, e.g., improving the terms of trade (Stockman 1980; Mussa 1984). Second, since a governmental program including subsidies might increase the welfare of the exporting country, it has a potential to cause unintended disputes with competitors or importers such as the U.S.-Brazil cotton dispute (Abbott, Paarlberg, and Sharples 1987; Baffes 2011).

CHAPTER VII

FORECAST RESULTS: THE RFS2 SCENARIO

Description of the U.S. Renewable Energy Policies

The U.S. government has provided a variety of programs to facilitate the biofuel industry since the late 1970s (Schnepf 2012). The renewable fuels policies can be subdivided into two categories: a 'direct' support/subsidy including the tax credits and an 'indirect' support via stimulating biofuel demand.

The 'direct' support measure provides the incentives for blenders and producers. The incentives are expected to increase the profits blenders can receive to increase the demand for biofuels. For example, the Energy Tax Act of 1978 had exempted excise tax by $0.40 per gallon. Following the expiration of the exemption provision in the Energy Tax Act of 1978, the Tax Reform Act of 1984 provided tax incentives for ethanol blenders ($0.52 ~ $0.60 per gallon) until 2004. The American Jobs Creation Act of 2004 had replaced the previous exemption with the Volumetric Ethanol Excise Tax Credit (VEETC) which amounted to $0.51 per gallon. The Food, Conservation, and Energy Act of 2008 (Farm Bill 2008) extended VEETC while reducing the subsidy to $0.45 per gallon. The tax credit incentive had been scheduled to expire at the end of 2010. They were extended to the end of 2013. Similar programs including the Biodiesel Mixture Excise Tax Credit (exemption of $1.00 per gallon through 2005-2013) and the Biodiesel Income Tax Credit ($1.00 per gallon through 2005-2013) have benefited the biodiesel industry. In addition, the 2.5% *ad valorem* tariff along with the 'closing-a-loophole against splash-and-dash' strengthened the U.S. biofuels' competitiveness (Schnepf 2012; Carriquiry and Babcock 2008).

The 'indirect' measures supported renewable industry by guaranteeing minimum demand or investing on infrastructure and research and development (R&D), and banning Methyl Tertiary Butyl Ether (MTBE). Representative of these sorts of programs is the Renewable Fuel Standard (RFS). The program mandating the minimum volume of biofuels domestically used was initiated with enactment of the Energy Policy Act of 2005 (figure B-148).

The initial biofuel standard (RFS1) required that at least 4.0 billion gallons of renewable fuels including ethanol and biodiesel should be used in 2006. The RFS1 also established the annual mandatory requirement which gradually increased to 7.5 billion gallons in 2012 (Schnepf and Yacobucci 2013). The Energy Independence and Security Act of 2007 has further expanded the target year and annually required volume. Under the RFS2 regime, the mandated minimum volumes for biofuels largely increased compared to the RFS1. The RFS2 differs from the RFS1 in that the total mandatory volume and the nested-category (advanced biofuels, biomass-based diesel, and cellulosic ethanol) should be met (EIA 2012). The RFS2 imposed a cap or upper limit on the volume of conventional or corn-based ethanol. The cap was set at 13.2 billion gallons in 2012, increases to 15 billion gallons by 2015, and is fixed at 15 billion gallons in following years until 2022.

A major difference between the RFS2 implementation scenario and the baseline scenario is that the impacts of the RFS2 are reflected in the modeling procedure. In the baseline, it has been implicitly assumed as if there are no mandatory requirements on the volume of the renewable fuels during the forecast period. As introduced earlier, the current renewable energy policy has established the mandatory use requirements for biofuels including corn-based ethanol and biodiesel at least until 2022. As the requirements are valid regardless of market prices, implementation of the RFS2 is expected to impose a lower bound (minimum use) on the demand side. Economic theory says that imposing a 'lower bound' on the demand side raises the equilibrium price or prevents the new equilibrium price from being lower than the price it would have been otherwise. In this sense, the RFS2 is expected to affect the biofuel prices and, in turn, the input crop markets.

For the sake of analysis, this study depends on some assumptions. First, this study mainly focuses on the conventional ethanol and biomass-based diesel (biodiesel). Second, other requirement under the RFS2, e.g. reduction on lifecycle greenhouse gas emission and feedstock conditions, are not considered. Third, the prices of crude oil (refinery's acquisition costs) and diesel are treated as exogenous factors. Fourth, for the ethanol sector, this study does not consider what is called the 'blending wall'[14]. Fifth, the share of soybean oil for biodiesel production is assumed to decrease under the RFS2 implementation. The assumption is grounded on the fact that the biodiesel producers are likely to diversify inputs responding to the expected higher price of soybean oil due to the implementation of the RFS2. Sixth, in this study, the mandatory volume is assumed

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14 According to Yacobucci (2010), the term, blending wall, is defined as the maximum amount of ethanol that can be blended and used for the U.S. transportation sector.

to be constant at 15.0 billion gallons for ethanol and 1.28 billion gallons for biodiesel during 2015-2022. Seventh, this study does not consider mandates for the 'advanced' ethanol market.

Based on the assumptions, some specifications used in the baseline forecast are modified to capture the impacts of the RFS2. To this end, the study imposed an inequality constraint on the domestic ethanol and biodiesel demand equations, as shown in equations (19) and (20). Unlike the baseline, the 'constrained' demand equations are in place for the domestic biofuel demand functions used in the baseline.

(19) $ETUSRFS_t = \text{Max (Forecasted Domestic Demand}_t\text{, Mandatory Requirement}_t\text{)}$,

where ETUSRFS = ethanol demand under the RFS2, the subscripts t represents time.

(20) $BDUSRFS_t = \text{Max (Forecasted Domestic Demand}_t\text{, Mandatory Requirement}_t\text{)}$,

where BDUSRFS = biodiesel demand under the RFS2, the subscripts t represents time.

Forecast Summary

Corn

National Equilibrium Price

Compared to the baseline, the U.S corn price under the RFS2 is forecasted to be higher by 17.91% during 2013-2022, on average (figure B-149). The forecast results show that the difference between the baseline price and the RFS2 implementation price gradually narrows over time, from 34.09% in 2013 to 4.04% in 2022. The narrowing price gap results from the fact that the higher corn price inducing producers to expand planted acres or switch to corn. Consequently, compared to the baseline, the planted acres and production of corn are forecasted to increase further. As the mandatory level, larger than the forecasted domestic demand during 2013-2022, is fixed after 2015, the additional increments of production will work to lower the corn price under the RFS2 implementation, reducing the difference from the baseline corn price.

Total Planted Acres

The forecast results indicate that the U.S. corn total planted acres would be larger than the baseline by 0.68% during 2013-2022, on average (figure B-150). The planted acres under the RFS2 implementation are larger than the baseline until 2020. The difference of the planted acres under the two scenarios is forecasted to decrease over time. As a result, the planted acres under the RFS2 implementation are forecasted to be smaller than the baseline by 0.32% during 2021-2022, on average.

Production

The forecast results indicate that the U.S. corn total production under the RFS2 implementation would be larger than the baseline by 0.8% during 2013-2022, on average (figure B-151). Since the estimates for the corn harvest acres and expected yields are unchanged, the changes in corn production depend strongly on the changes in planted acres. Like the forecast result for the planted acres, the production gap under the two scenarios gradually decreases over time such that the total production under the RFS2 implementation is forecasted to be smaller than the baseline by 0.21% during 2021-2022, on average.

Demand

Under the RFS2 implementation, the U.S. corn total demand is forecasted to be larger than the baseline by 15.41% during 2013-2022, on average (figure B-152). The RFS2 is forecasted to increase corn use for ethanol production by an average of 81.25% compared to the baseline or in the absence of the program. As the forecasted domestic demand for energy production does not meet the mandated requirement, the minimum requirement is in effect throughout the forecast period.

The higher corn price reduces quantity demanded by other sectors. For example, compared to the baseline, the corn demand decreases during 2013-2022: feed (6.32%, on average), food and industry (2.11%), and exports (4.04%). As a result, the changes in corn total demand increases by 21.6% during 2013-2022, on average.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the corn ENRs in the Corn Belt, the Central Plains, and the North East is compared. More detailed information on the regional corn ENRs changes is available in Appendix D.

The average ENRs under the RFS2 implementation are higher than the baseline by 28.44% during 2013-2022 (figure B-153). As the corn price under the RFS2 implementation begins falling down after 2015, the difference of the average ENRs between the RFS2 and the baselines narrows down over time, from 54.77% in 2013 to 6.73% in 2022.

Barley

National Equilibrium Price

Compared to the baseline, imposing the RFS2 constraint raises the U.S. national barley price by 8.45% during 2013-2022, on average (figure B-154). Under the RFS2 implementation, a sharp drop of the barley price in 2013 is forecasted. In later years, the price is forecasted to rise with marginally decreasing rates.

Total Planted Acres

The forecast results indicate that the U.S. total barley planted acres would decrease by 0.31% compared to the baseline during 2013-2022, on average (figure B-155). In spite of the higher barley price and ENRs, the continuous reduction in the planted acres is forecasted to be maintained.

Production

The forecast results indicate that the U.S. barley total production would decrease by 0.30% compared to the baseline during 2013-2022, on average (figure B-156). Because the estimates for the barley harvest acres and expected yields are unchanged, the changes in production highly depend on the changes of the planted acres.

Demand

Under the RFS2 implementation, the U.S. barley total demand is forecasted to increase by 0.21% compared to the baseline during 2013-2022, on average (figure B-157). The feed and food demands are forecasted to increase by 5.28% and 1.51% compared to the baseline during 2013-2022. In contrast, the export demand is forecasted to experience considerable decrease compared to the baseline, averaging 20.74% during 2013-2022. The impacts of higher barley price on the feed and food demand may be mitigated because of the rising prices of substitutes.

Expected Net Returns (ENRs)

A simple average of the barley ENRs in the Far West and the Northern Plains is presented in figure B-158. The higher barley price under the RFS2 implementation enables the average ENRs to increase by 11.50% compared to the baseline during 2013-2022, on average. Other crops' increased ENRs hinder the barley planted aces from increasing proportional to the ENRs changes.

Cotton

National Equilibrium Price

Compared to the baseline, imposing the RFS2 constraint raises the U.S. national cotton price by 5.30% during 2013-2022, on average (figure B-159). The difference of price between the two scenarios is forecasted to continuously increase to 8.54% in 2019, and then begin to narrow down to 6.22% in 2022.

Total Planted Acres

The forecast results indicate that, in spite of the higher cotton price and ENRs, the U.S. cotton total planted acres are forecasted to decrease by 0.81% compared to the baseline during 2013-2022, on average (figure B-160). The planted acre reduction can be due to the relatively higher increments of competing crops' ENRs, and the aftermaths of drastic planted acres decrements in recent years.

Production

The forecast results indicate that the U.S. cotton total production would decrease by 1.98% compared to the baseline during 2013-2022, on average (figure B-161). Since the estimates for cotton harvest acres and expected yields are unchanged, the changes in production largely depend on the changes in planted acres.

Demand

Under the RFS2 implementation, the U.S. cotton milling and export demands are forecasted to decrease by 1.65% compared to the baseline during 2013-2022, on average (figure B-162). The RFS2 requirements are forecasted to have larger impacts on the domestic milling demand than on the export demand. The higher cotton price is forecasted to further reduce the historically declining domestic milling industry. Consequently, the milling demand is forecasted to decrease by 8.29% compared to the baseline during 2013-2022, on average. On the other hand, the export demand is forecasted to decrease compared to the baseline, by averaging 1.15%.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the cotton ENRs in Delta States, Far West, South East, and Southern Plains is compared. More detailed information on the regional cotton ENRs is available in Appendix D.

Changes in the average ENRs under the RFS2 implementations are in line with theoretical expectations. The higher cotton price increases the average cotton ENRs by 11.05% compared to the baseline during 2013-2022 (figure B-163). However, as the ENRs of competing crops are also forecasted to increase, the impacts of increased cotton ENRs on planted acres changes are forecasted to be limited.

Oats

National Equilibrium Price

Compared to the baseline, continuous implementation of the RFS2 is forecasted to raise the U.S. oat national average price by 9.71% compared to the baseline during 2013-2022 (figure B-164). Also, the impacts of the renewable energy policy on the oat price are forecasted to be mitigated over time. The difference between the RFS2 implementation price and the baseline price is forecasted to be maximized in 2015 (14.80%), and gradually narrow in later years to arrive at 2.05% in 2022.

Total Planted Acres

The forecast results indicate that the U.S. oat total planted acres would decrease by 0.86% compared to the baseline during 2013-2002, on average (figure B-165).

Because oats compete with corn in the major production regions, oat producers can be induced to reduce the oat planted acres, responding to the larger increase in corn ENRs compared to the changes for oat ENRs.

Production

The forecast results indicate that the U.S. oat total production would decrease by 0.92% compared to the baseline during 2013-2002, on average (figure B-166). As the estimates for oat harvested acres and expected yields remain unchanged, the oat production reduction mainly comes from reduced planted acres.

Demand

Under the RFS2 implementation, the U.S. oat total demand is forecasted to decrease by 0.39% compared to the baseline during 2013-2022, on average (figure B-167). The oat seed, feed, and export demands are forecasted to decrease whereas the food demand is forecasted to increase. The higher oat price is expected to reduce the feed and export demand. On the other hand, the historically increasing food demand is forecasted to continuously increase due to the higher prices of substitutes.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the oat ENRs in the Far West, the Lake States, the Northern Plains, and the Southern Plains is compared. More detailed information on the regional oat ENRs is available in Appendix D.

The average ENRs under the RFS2 implementation are larger than the baseline 24.81% during 2013-2022 (figure B-168). The ENRs increments invoked by the RFS2 are forecasted to marginally diminish over time.

Long Grain (LG) Rice

National Equilibrium Price

Compared to the baseline, the U.S. LG rice price is forecasted to be higher by 2.90% during 2013-2022, on average (figure B-169). Also, the LG rice price under the RFS2 implementation stays higher than the baseline except for 2014.

Total Planted Acres

The forecast results indicate that the U.S. LG rice total planted acres would increase by 0.68% compared to the baseline during 2013-2022, on average (figure B-170). Unlike other crops, the total planted acres are forecasted to expand. The difference is relevant with the attribute of rice industry, the presence of a high entry-exit barrier. The higher LG rice price is forecasted to induce producers to allocate more lands for LG rice. However, as the planted acres are inelastic with respect to the LG rice ENRs, changes in the price and ENRs can have limited impacts on the planted acre changes.

Production

The forecast results indicate that the U.S. LG rice total production would increase by 0.87% compare to the baseline during 2013-2022, on average (figure B-171). The production increases are due to the changes in planted acres and annually increased expected yields.

Demand

The forecast results indicate that implementing the RFS2 would not have substantial impacts on the U.S. LG rice demand. The higher LG rice price is forecasted to decrease the export demand by 1.79% during 2013-2022, on average (figure B-172). In contrast, the domestic demand is forecasted to continuously increase in spite of the high price. Compared to the baseline, the domestic demand is forecasted to increase by 0.51% during 2013-2022, on average. Put together, the LG rice total demand is forecasted to decrease by 0.44% during 2013-2022, on average.

Expected Net Returns (ENRs)

For illustrative purpose, the LG rice ENRs in the Delta States are compared. Changes in the ENRs under the RFS2 implementation are in line with theoretical expectations. Under the RFS2 implementation, the ENRs are forecasted to increase by 4.33% compared to the baseline during 2013-2022, on average (figure B-173). Exceptionally, the ENRs under the RFS2 implementation are forecasted to be lower by 5.33% compared to the baseline in 2014.

Medium/Short Grain (MSG) Rice

National Equilibrium Price

Compared to the baseline, the U.S. MSG rice price is forecasted to be higher by 5.32% during 2013-2022, on average (figure B-174). Also, unlike LG rice, the MSG rice price under the RFS2 implementation maintains higher than the baseline through the forecast years.

Total Planted Acres

The forecast results indicate that the U.S. MSG rice total planted acres would increase by 2.88% compared to the baseline during 2013-2022, on average (figure B-175). Unlike other crops, the MSG rice planted acres are forecasted to expand during the forecast period.

Production

The forecast results indicate that the U.S. MSG rice total production would increase by 2.49% compared to the baseline during 2013-2022, on average (figure B-176). The increment is due to the change in the planted acres and annually increasing expected yields.

Demand

The RFS2 implementation is not forecasted to have substantial impacts on the U.S. MSG rice demand. However, the higher price is forecasted to decrease the domestic and export demand by 1.61% and 2.87% during 2013-2022 on average, (figure B-177). The decrease in domestic demand is in contrast with the increase in the LG rice domestic demand. Put together, the MSG rice total demand is forecasted to decrease by 1.92% during 2013-2022, on average.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the MSG rice ENRs in the Delta States and the Far West is compared. Changes in the average ENRs under the RFS2 implementation are in line with theoretical expectations. Impacts of the higher prices are not fully transmitted such that increments in the average ENRs are forecasted to average 7.30% during 2013-2022 (figure B-178).

Sorghum

National Equilibrium Price

Compared to the baseline, the national equilibrium sorghum price is forecasted to be higher by 15.04% during 2013-2022, on average (figure B-179). The difference of prices under the baseline and the RFS2 implementation is forecasted to increase until 2015 (25.27%), and then keep narrowing to 3.13% in 2022.

Total Planted Acres

The forecast results indicate that the U.S. sorghum total planted acres would be almost independent of the RFS2 implementation. Under the RFS2 implementation, the planted acres are projected to increase by 0.09% during 2013-2022, on average (figure B-180). At the regional level, sorghum planted acres are forecasted to remain unchanged in the Central Plains whereas an average of 0.20% increment is forecasted in the Southern Plains.

Production

The forecast results indicate that the U.S. sorghum total production would decrease by 0.11% compared to the baseline during 2013-2022, on average (figure B-181). The decreased planted acres in Southern Plains are forecasted to largely affect the reduced production.

Demand

The forecast results show that the U.S. sorghum total demand would increase by 0.07% compared to the baseline during 2013-2022, on average (figure B-182). The sorghum export demand is forecasted to decrease by 12.00% during the forecast period, on average. The decrement in export demand is largely because of the relatively large own price elasticity (-0.504). On the feed demand side, the higher corn price is forecasted to mitigate the effects of the higher sorghum price such that the demand is forecasted to increase by 5.60% during 2013-2022, on average. The sorghum food demand is forecasted to increase by 16.08% during 2013-2022, on average.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the sorghum ENRs in the Central Plains and the Southern Plains is compared. Changes in the average ENRs under the RFS2 implementation are in line with theoretical expectations. The higher price caused by the RFS2 are forecasted to increase the average ENRs by 27.33% during 2013-2022, on average (figure B-183).

Soybeans

National Equilibrium Price

Compared to the baseline, the RFS2 is forecasted to raise the U.S. national soybeans price by 11.44% during 2013-2022, on average (figure B-184). The biofuel mandates are forecasted to boost the demand for biodiesel and soybean oil. The increased demand for soybean oil is forecasted to result in larger soybean crushing demand.

Total Planted Acres

The forecast results indicate that the U.S. soybean total planted acres would decrease by 1.17% compared to the baseline during 2013-2022, on average (figure B-185). The reduction can be due to the fact that soybeans and corn compete in most regions, and that the RFS2 benefits not only soybean (biodiesel) but also corn (ethanol). Even though the soybean price and ENRs are forecasted to be higher, even larger increases in the corn ENRs may induce part of the soybean producers to allocate lands to corn.

Production

The forecast results indicate that the U.S. soybean total production would decrease by 1.11% compared to the baseline during 2013-2022, on average (figure B-186). The production decreases are mainly due to the reduction in planted acres.

Demand

Under the RFS2 implementation, the U.S. soybeans total demand would decrease by 1.04% compared to the baseline during 2013-2022, on average (figure B-187). Also, the soybean crushing and export demand are forecasted to decrease by 0.96% and 0.20% compared to the baseline on average. The decrease in crushing demand is mainly due to lower processing margins. As the soybean price is forecasted to rise larger than the prices of soybean meal and oil, it follows that the operating margins of crushing soybeans are expected to be worsened (figure B-188). On the export demand side, the higher soybean price is a primary reason for the reduced demand.

Expected Net Returns (ENRs)

. For illustrative purpose, a simple average of the soybean ENRs in the Corn Belt, the Central Plains, the Lake States, and the Northern Plains is compared. Changes in the average ENRs under the RFS2 implementations are in line with theoretical expectations;

the biofuel mandates are forecasted to increase the average ENRs by 14.28% during 2013-2022 (figure B-189).

Soybean Meal

National Equilibrium Price

Compared to the baseline, the RFS2 is forecasted raise the national equilibrium soybean meal prices by 6.53% compared to the baseline during 2013-2022, on average (figure B-190). As discussed earlier, less soybean meal and oil are forecasted to be produced due to the worsened soybean crushing margins. Thus, the soybean meal price is expected to rise, with other things equal. The marginal increase of soybean crushing demand after 2018 is forecasted to contribute for lowering the soybean meal price.

Production

The forecast results indicate that the U.S. soybean meal total production would decrease 0.96% compared to the baseline during 2013-2022, on average (figure B-191). The decrement comes from the reduced soybean crushing demand because the soybean meal production is assumed to be proportional to the quantity of soybeans used for crushing.

Demand

The forecast results indicate that the U.S. soybean meal total demand would decrease 0.95% compared to the baseline during 2013-2022, on average (figure B-192).

The decreases are more striking for the export demand (2.41%, on average) than the domestic demand (0.57%, on average) during the forecast period. On the domestic demand side, the number of poultry (broiler) is assumed to increase during 2013-2022, which partially offsets the impacts of the higher soybean meal price. On the export demand side, a continuously increasing consumption captured by trend partially offsets the impacts of the raised soybean meal price.

Soybean Oil

National Equilibrium Price

The forecast results indicate that the U.S. national soybean oil price would be higher by 5.43% compared to the baseline during 2013-2022, on average (figure B-193). The higher price is expected to result from the increased soybean oil demand by the RFS2. The average price changes for soybean meal (6.53%) and soybean oil (5.43%) are smaller than the changes for soybeans (11.44%). Consequently, the soybean crushing margins are forecasted to substantially lower during 2013-2022.

Production

The forecast results indicate that the U.S. soybean oil total production would decrease by 1.00% compared to the baseline during 2013-2022, on average (figure B-194). The reduced production comes from the decreased soybean crushing demand in that the soybean oil production is assumed to be proportional to the quantity of soybeans used for crushing.

Demand

The forecast results indicate that the U.S. soybean oil total demand would decrease by 0.91% compared to the baseline during 2013-2022, on average (figure B-195). The reduction in the total demand is mainly due to decreases in the domestic and residual demand (1.05%, on average) and export demand (4.76%, on average). In contrast, the demand for biodiesel production is forecasted to increase by 1.27%, on average. As assumed earlier, because the share of soybean oil for biodiesel production is lower under the RFS2 implementation than under the baseline, the increment of the biofuel demand for soybean oil is smaller than what it would have been otherwise.

Wheat

National Equilibrium Price

The forecast results indicate that the U.S. national wheat price would rise by 10.29% compared to the baseline during 2013-2022, on average (figure B-196). The recent years' unusually high wheat prices are forecasted to have a lingering effect until 2013. The difference of the prices under the RFS2 implementation and the baseline are forecasted to continuously increase to 14.04% in 2016, and then narrow down to 6.85% in 2022.

Total Planted Acres

The forecast results indicate that the U.S. wheat total planted acres would decrease by 0.68% compared to the baseline during 2013-2022, on average (figure B-

197). The decrement in the planted acres in spite of the higher wheat price is due to competition with corn and/or soybeans.

Production

The forecast results indicate that the U.S. wheat total production would decrease by 0.49% compared to the baseline 2013-2022, on average (figure B-198). The reduction is mainly due to the decreased planted acres.

Demand

The RFS2 implementation is forecasted to have little impacts on the U.S. wheat total demand, decreasing it by 0.35% during 2013-2022, on average (figure B-199). The relatively higher prices of substitutes enable the wheat feed and residual demand and food demand to increase by 0.26% and 1.01% during 2013-2022 on average. In contrast, the higher wheat price is forecasted to decrease the wheat export demand by 2.10% during 2013-2022, on average.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the wheat ENRs in the Central Plains, the Northern Plains, and the Southern Plains is compared. Changes in the wheat ENRs under the RFS2 implementation are in line with theoretical expectations. The impacts of the RFS2 are forecasted to be directly transmitted to the regional ENRs, increasing the average ENRs by 16.87% during 2013-2022, on average (figure B-200).

Peanuts

National Equilibrium Price

Compared to the baseline, the U.S. national equilibrium peanuts price is forecasted to be substantially independent of the RFS2 implementation. The price is forecasted to rise by 0.14% compared to the baseline during 2013-2022, on average (figure B-201).

Total Planted Acres

The forecast results indicate that the U.S. peanut total planted acres would decrease by 0.7% compared to the baseline during 2013-2022, on average (figure B-202). The small changes in the planted acres are due to the fact that the planted acres are mainly affected by previous year's planted acres rather than the peanut ENRs as shown in Chapter IV.

Production

The forecast results indicate that the U.S. peanut total production would decrease by 0.07% compared to the baseline during 2013-2022, on average (figure B-203). The reduction of production is mainly due to the decreased planted acres. Annually increased expected yields partially offset the impacts of the decreased planted acres on the production.

Demand

As the U.S. peanut price is forecasted to be relatively independent of the renewable fuel policy, little changes are expected for the U.S. peanut total demand due to the price change. The total demand would decrease by 0.4% compared to the baseline during 2013-2022, on average (figure B-204). Even though the peanut crushing operating margins are forecasted to be lower by 16.11% compared to the baseline, the crushing demand is forecasted to decrease only by 0.03% during 2013-2022, on average. More remarkable changes are forecasted in the export demand, decreasing by 0.76% compared to the baseline during the forecast period, on average.

Expected Net Returns (ENRs)

For illustrative purpose, the peanut ENRs in the South East are compared to the baseline case. Changes in the peanut ENRs under the RFS2 implementation are in line with theoretical expectations. The slightly higher price, combined with higher expected yields, is forecasted to increase the ENRs by 0.25% during 2013-2022, on average (figure B-205).

Ethanol

National Equilibrium Price

The RFS2 is forecasted to have large impacts on the representative ethanol price in Omaha, Nebraska. The continuation of the renewable fuel policy is forecasted to cause a higher ethanol price compared to the baseline, by an average of 33.21% during

2013-2022 (figure B-206). The forecast results show that the ethanol price would rise to arrive at $4.11 per gallon in 2015, which is higher than the baseline price by 53.48%. In following years, the difference between the prices under the RFS2 implementation and the baseline is forecasted to narrow to 4.36% in 2022. The narrowing is expected to be from the further increases in the corn planted acres spurred by the RFS2.

Production

The forecast results indicate that the RFS2 would cause the domestic ethanol production to increase substantially during 2013-2022, by 12.37% compared to the baseline, on average (figure B-207). It can be also shown that marginal increments in the production reduce over time. The ethanol domestic production is forecasted to increase throughout the forecast years, ranging from 13.92 billion gallons in 2013 to 14.99 billion gallons in 2022. Consequently, the domestic production is forecasted to marginally meet the annual requirements after 2018 (90.73% in 2019, 93.57% in 2020, 96.47% in 2021, and 99.06% in 2022).

Demand

The baseline forecast results support that the U.S. domestic demand fails to meet mandatory usage level throughout the forecast period in the assumed absence of the RFS2. That is, under the RFS2 implementation, each year's mandate requirement becomes a binding lower bound. The forecast results show that the minimum requirements of 13.8 and 14.4 billion gallons are in effect through 2013 and 2014, (figure B-208). In later years, at least 15 billion gallons of ethanol are forced to be domestically consumed by the RFS2. As the domestic ethanol production is forecasted to fail to satisfy the mandates, the deficit would be imported. Consequently, the U.S. ethanol net export demand is forecasted to further decrease compared to the baseline, averaging 1.74% during 2013-2022.

Operating Margins

The forecast results show that dry and wet milling operators would benefit from the RFS2 implementation. The mandates are forecasted to improve the dry milling and wet milling operating margins by 69.95% and 59.80% during 2013-2022 on average, (figures B-209 and B-210). As the ethanol operating margins heavily depend on the ethanol price, difference of the margins between under baseline and the RFS2 implementation is forecasted to narrow over time.

Biodiesel

National Equilibrium Price

The RFS2 implementation is forecasted to have strong impacts on the biodiesel price during 2013-2022. The continuation of the renewable fuel policy is forecasted to cause a higher biodiesel price compared to the baseline, by an average of 16.41% during 2013-2022 (figure B-211). The forecast results show that the biodiesel price would rise to a peak of $4.96 per gallon in 2016, higher than the baseline price by 20.46%. In following years, the difference of the prices under the RFS2 implementation and the baseline is forecasted to narrow to 14.83% in 2022.

Production

The forecast results indicate that the RFS2 would cause the domestic production to increase by 51.04% compared to the baseline during 2013-2022, on average. It can also be shown that marginal increments in the production decline over time, from 76.04% in 2013 to 36.55% in 2022 (figure B-212). The U.S. biodiesel total production is forecasted to increase throughout period, ranging 985.38 million gallons in 2013 to 1325.10 million gallons in 2022. The production is forecasted to marginally satisfy the annual requirements in 2022 (92.44% in 2019, 96.10% in 2020, and 99.80% in 2021).

Demand

The baseline forecast results support that the U.S. domestic demand fails to meet mandatory usage level throughout the forecast period in the assumed absence of the RFS2 (figure B-213). That is, under the RFS2 implementation, each year's mandated requirement becomes a binding lower bound. The minimum requirements of 1.28 billion gallons are forecasted to be in effect during 2013-2022. As the domestic biodiesel production is forecasted to fail to satisfy the mandates until 2021, the deficit would be imported to meet the requirements. The U.S. is forecasted to switch from a net exporter (under the baseline) to a net importer (under the RFS2 implementation) until 2020. Dependence on the imports is forecasted to marginally decrease over time. The biodiesel net export demand is forecasted to start from -327.02 million gallons in 2013 through -137.72 million gallons in 2018 to reach 52.64 million gallons in 2022.

Operating Margins

The forecast results show that biodiesel processors would benefit from the RFS2. The mandates are forecasted to improve the biodiesel operating margins by 130.44% during 2013-2022, on average (figure B-214). As the biodiesel operating margins heavily depend on the biodiesel price, the difference of margins under the baseline and the RFS2 implementation is forecasted to narrow over time. Unlike the baseline, the RFS2 is forecasted to prevent the operating margins from being negative in any forecast year.

Measurements of Changes in Welfare and Policy Implications

As discussed earlier, the continuation of the RFS2 is expected to cause higher prices for input crops, corn and soybeans (soybean oil). The higher prices are expected to increase the producer surplus at the expense of the consumer surplus. The welfare changes under the RFS2 implementation are summarized in table C-101. The signs of welfare changes are in line with theoretical expectations. If confined to the U.S. domestic agricultural sector, the total producer surplus increments are forecasted to be larger than the total consumer surplus loss by an average of $38.3 billion through 2013-2022 under the RFS2.

The welfare changes for the related participants are most striking for the most relevant crops, corn and soybeans. The corn producers are expected to benefit the most from the RFS2 continuation due to higher corn prices and the guaranteed (mandated) ethanol production demand regardless of market prices. The largest portion of corresponding CS loss is forecasted to be transferred to the livestock sector whose CS loss averages -$4,444.10 million during 2013-2022. The CS loss for corn-food consumers is approximated at -$1,247.41 million during 2013-2022, on average.

The higher corn prices are expected to deteriorate the operating margins for dry and wet milling processors. However, CS loss for the processors is expected to be compensated by the higher prices of ethanol and by-products. Unlike the corn sector, larger CS loss than PS increase is forecasted in the U.S. soybean and by-product sectors. The difference comes from the fact that the RFS2 is forecasted to substantially increase biodiesel imports rather than boost the domestic production, and that the biodiesel production's dependence on soybean oil is assumed to be reduced under the RFS2. For these reasons, the soybean PS increments due to the RFS2 are relatively smaller compared to the corn PS changes. The higher prices of soybeans and byproducts work to reduce the CS.

The impacts of the RFS2 are expected to affect not only corn and soybeans but also other crops in terms of welfare changes. As discussed earlier, the RFS2 is forecasted to induce producers to allocate more land for corn and/or soybeans and reduce the planted acres for other crops. The price and production changes resulted from the planting decisions will change the welfare in other crop sectors. For most crops other than corn and soybeans, such changes are forecasted to benefit producers while reducing the corresponding CS. Put together, the RFS2 is forecasted to increase the total welfare by an approximation $5,645.94 million during 2013-2022, on average. This welfare increment mainly comes from corn and soybean producers benefiting from higher prices. The relevant welfare loss of the foreign consumers not included. It is to be noted that the range of the welfare approximation is confined to the U.S. agricultural sector, excluding the biofuel sectors. Substantially larger welfare changes are expected when including the biofuel sector in that the mandatory level is forecasted to be binding throughout 2013-2022 and that the mandates are required to be consumed regardless of market prices. The RFS2 is forecasted to incur the total welfare loss at an average of $131.38 billion in the biofuel sector during 2013-2022. This total welfare loss mainly comes from the fact that the CS loss due to the higher prices is larger than PS increase in the absolute terms.

From a policy aspect, the RFS2 is expected to transfer a large portion of consumer surplus to the agriculture and biofuel producers. These welfare changes are accompanied with a large deadweight loss, deteriorating the total social welfare (Gorter and Just 2009). The relevant government expenditures will be more dependent on the 'direct' programs such as tax credits than the 'indirect' approaches including the RFS2. The expected changes in government expenditure may be analyzed in a qualitative manner. Given that the tax credits are continuously maintained, the government expenditure will increase because tax credits should be paid to the larger of forecasted demand and the mandatory level. On the other hand, the forecasted higher crop prices might work to reduce the program payments such as CCP. If the tax credits for ethanol and biodiesel were to be completely eliminated or reduced[15], the reduced government expenditures are expected to compensate the total welfare loss in the biofuel markets. The policy will worsen both producer and consumer surplus to further decrease the total welfare.

[15] The tax credits had been expired on December 31, 2011. However, the American Taxpayer Relief Act of 2012 enabled the credits to retroactively extend to December 31, 2013.

CHAPTER VIII

FORECAST RESULTS: THE 2014 FARM BILL SCENARIO

Description of Historical Farm Bills and the 2014 Farm Bill

The U.S. agricultural sector has gone through a large number of farm bills, each of which affected the sector in multiple ways. The Food Security Act of 1985 (1985 Act), passed by Congress December 18, 1985, replaced the Agriculture and Food Act of 1981 (1981 Act) and provided a framework for the five subsequent years. The 1985 Act continued many of major provisions enacted by the 1981 Act, including price and income supports, and acreage reduction program (ARP) (Glaser 1986). Representative of price and income support measures are the loan program and the target price. They were applied to feed grains (barley, corn, oats, and sorghum), wheat, cotton, soybeans, rice, and peanuts from 1986 through 1990.

The Food, Agriculture, Conservation, and Trade Act of 1990 (FACT) made a number of important amendments to existing laws and programs (Pollack and Lynch 1991). The FACT Act continued price support programs subject to a basic loan rate calculation. Mandatory marketing loans were initiated for cotton, rice, and oilseeds. This Act also continued ARP and introduced new schemes such as Planting Flexibility provision and Agricultural Resources Conservation Program.

The Federal Agricultural Improvement and Reform Act of 1996 (FAIR) was passed April 4, 1996. The FAIR Act took a distinguishable step by eliminating the 'coupling' between farm price and program payments (USDA ERS 1996). This ‘decoupling’ is achieved by providing a fixed amount of income support based on a producer's production history, instead of the farm price, via ‘Production Flexibility contracts (PFC)’ (Outlaw et al 2008). Introduction of the program led producers to depend more heavily on market signals than government programs for their production decision making. The FAIR Act enlarged flexibility conditions initiated by the FACT Act while maintaining the non-recourse loan provision with some modifications.

The Farm Security and Rural Investment Act of 2002 was enacted May 13, 2002 to provide a farm program for the next six years. One of the most important changes made in this Act was the introduction of the Counter-Cyclical Payments (CCP). When a trigger condition is met, CCP is paid to eligible producers to supplement their incomes. Meanwhile, Direct Payments (DP) succeeded PFC which had been in effect through 1996-2002. The range of covered commodities by DP was expanded to include soybeans and peanuts. In addition, previous support programs for peanuts (price support and marketing quota) were replaced with the newly introduce programs including DP and CCP (USDA ERS 2014).

The Food, Conservation, and Energy Act of 2008 was passed in June 2008. As the most recent Farm Bill, it maintained the main commodity provisions with several adjustments and revisions (USDA ERS 2014). For example, the 2008 Farm Bill retains DP, CCP, and loan deficiency payments enacted by previous farm bills. On the other hand, it adopted a revenue-based program named Average Crop Revenue Election (ACRE). Also, the Energy Title in the 2008 Farm Bill provided grounds for expanding or newly adopting biofuel programs.

With the expiration of the Food, Conservation, and Energy Act of 2008 in the 2013 crop year, Congress worked to develop a new farm bill. As a result, through a long process, the U.S. Senate approved its farm bill proposal, referred to S.954 or the Agriculture Reform, Food, and Jobs Act of 2013, June 10, 2013 (Schnefp 2013, Chite 2013). The House passed its own bill, H.R.2642 or the Federal Agriculture Reform and Risk Management (FARRM) Act of 2013, July 11, 2013. The 2014 Farm Bill was enacted February 7, 2014.

Among a number of titles and provisions in the 2014 Farm Bill, this study focuses on Price Loss Coverage (PLC) and Agriculture Risk Coverage (ARC) in TITLE I-COMMODITIES.

Major Commodity Programs in the 2014 Farm Bill

The enacted 2014 Farm Bill (P.L. 113-79) signed by the President February 7, 2014 modified farm programs proposed by the House and the Senate Bill.

Regarding Title I, the 2014 Farm Bill repealed the previous farm support programs including DP and CCP, which have been in effect since the 2002 Farm Bill. The Farm Bill also repealed the Average Crop Revenue Election (ACRE) introduced in the 2008 Farm Bill. As an alternative to CCP and ACRE, the 2014 Farm Bill introduced PLC and ARC. Both programs provide a safety net for covered crops including barley, corn, oats, long grain rice, medium/short grain rice, grain sorghum, soybeans, wheat, peanuts, pulse crops, and other oilseeds (Schnefp 2013). Unlike the 2008 Farm Bill, cotton is not included in this category[16].

The 2014 Farm Bill replaced the previous CCP program with PLC. Also, the 2014 Farm Bill introduced ARC in place of ACRE. One of major changes made in the 2014 Farm bill is that producers cannot select PLC and ARC at the same time. The 2014 Farm Bill suspends the provision of ‘permanent price support authority’ under the Agricultural Adjustment Act of 1938 and Agricultural Adjustment Act of 1949 until 2018. This study assumes that the provisions in the 2014 Farm Bill will be continuously implemented through 2022.

Price Loss Coverage (PLC)

The new deficiency payment program in PLC plays a similar role to the previous CCP (Paulson 2012). Key definitions of terms relevant to PLC are presented in table C-102. Based on the definitions, PLC payments may be triggered (guaranteed) when an effective price is lower than the predetermined 'reference price'[17].

The effective price equals the higher of the national 12-month national average price and national average loan rates. Once the trigger condition is met, PLC payment rates equal the difference between the reference price and the effective price.

Calculating per acre PLC payments requires corresponding payment yields. Basically, historical CCP yields are used as PLC payment yields. Producers

16 Separate insurance programs (Supplementary Coverage Option (SCO) and Stacked Income Protection Plan (STAX)) were introduced for cotton. However, the programs are not included in the model in this study.

17 The term 'reference price' is analogous to 'target price' in the 2008 Farm Bill.

participating in PLC will be given a one-time, irrevocable option to update their payment yields to 90 percent of their 2008-2012 average yields as their payment yields[18]. Consequently, the average PLC payment yields for regions in this study's model may be calculated in the equation (21).

$$(21)\quad \text{Average PLC Payment Yields}_i = (1-\alpha) * \text{Historical CCP Yields}_i + 0.9 * \alpha * \text{2008-2012 Average Yields}_i ,$$

,where α and i denote the portion of planted acres of the produces updating their yield profiles and covered crops.

PLC payments can be calcualted by multiplying PLC payment rates by PLC payment yields and 85% of base acres. The 2014 Farm Bill imposes a per-person-cap of $125,000 on the combination of PLC, ARC, and MLG/LDP with an exception of peanuts which has its own $125,000 limitation, and reduces the AGI limit to $900,000 (Chite 2014).

Agriculture Risk Coverage (ARC)

ARC provides a safety net for potential shallow losses. ARC will be in effect through crop years 2014-2018.[19] Under the 2014 Farm Bill, producers of covered commodities are prevented from receiving simultaneous payments from PLC and ARC. Also, the trigger condition for ARC works to guarantee 86% of benchmark revenue

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18 Any crop year when no covered commodity was planted is excluded.
19 In this study, ARC is assumed to maintain until 2022.

(table C-103). ARC allows producers to irrevocably elect a farm or county option when calculating the benchmark revenue. Once a producer elects one of the two, the decision can not be switched.

For the sake of analysis, this study depends on several assumptions. First, out of producers choosing PLC, only a half of them are assumed to update their yield profiles based on their own 2008-2012 yields. Second, ARC is assumed to be in effect until 2022. Third, under the ARC scheme, no producers use farm-level yields to calculate their Benchmark Revenue. The last assumption comes from the unavailability of individual farm-level yield data. In spite of these strong assumptions, there is an important issue to address; can the regional-level data in this study appropriately approximate the county-level data when evaluating PLC/ARC payment trigger conditions?

Using Regional-level Data as a Proxy of County-level Data in Evaluating the Expected Program Payments

As described above, PLC and ARC include county-level or individual farm-level data in their payment trigger conditions. However, because the data in this study are at the regional or multi-states level, a question arises as to whether using the regional data can reasonably capture the characteristics of the county-level data in the 2014 Farm Bill. It is virtually impossible to collect annual farm-level data for all cover crops. Thus, this study focuses instead on approximating the county-level data using the regional data. For this purpose, it is necessary to compare the expected payments calculated with regional-level data to those with county-level data. To this end, this study conducts a hypothetical evaluation regarding the expected payment rates under the PLC and ARC scheme using 2002-2012 data.

As the first step, several assumptions are made to simplify the expected PLC and ARC payment comparison process without losing generality. First, a half of producers participating in PLC determines to update their yield profiles. Second, all of the ARC participants choose a county-level option to calculate their benchmark revenue. Third, half of all producers participate in PLC and ARC such that the expected program payment amounts are equal to an average of PLC and ARC payments.

The second step requires measuring yields the participants will profile. Under PLC, this profiled yield is used to calculate per acre average PLC payments. Under ARC, the profiled yield is a criterion for the ARC payment triggering. However, the presence of a large number of missing observations in county-level data might mislead such components in the program triggering formulas as 2008-2012 average yields (PLC) or olympic average (average during a 5-year period, dropping the highest and lowest values) of the most recent five yields (ARC). For example, if there are only 1~2 observations during 2008-2012 for a certain county's yield data (the average of these values are used to caluculate updated yield profiles), the calculated average yields can differ from what they would have been with full observations. To mitigate this problem, this study defines an 'eligible' county. The 'eligible' county is defined as a county which has at least eight annual yields data during 2002-2012 and three observations during 2008-2012. A number of 'eligible' counties for each covered commodity by region is presented in table C-104. Descriptive statistics for the counties are summarized in table C-105.

As the third step, sample counties are selected exclusively out of the ‘eligible’ counties to calculate county-level yield, ACR, and hypothetical expected payments . A sample size ranges from seven to fifteen depending on the number of ‘eligible’ counties. It is to be noted that, among the ‘eligible’ counties, there is considerable variation in planted acres across counties. It implies that using a simple average of payment rates may not precisely reflect the total amount of program payments. Thus, calculating the hypothetical expected program payment rates requires imposing weights on an indiviual county’s payment rates. In this study, each county’s planted acres available from NASS are used to calculate the weighted average of program payments.

In the fourth step, profiled yield, ACR, and hypothetical expected payments are calculated using regional data.

As the last step, the hypothetical expected payments using county-level and regional data are compared to evaluate appropriateness of approximation using the regional level data. Based on the third assumption in the first step, the hypothetical expected payments equal the average of PLC and ARC payments. The comparison results indicate that using the regional data for calculating expected program payment tends to underevaluate what would have been calculated using county-level data (figure B-215). The range of difference lies within 10% cxcept for MSG rice.

Forecast Summary

Corn

National Equilibrium Price

Compared to the baseline, the U.S corn price under the newly introduced programs is forecasted to remain largely unchanged during 2013-2022 (figure B-216). Under the 2014 Farm Bill, the national corn price is forecasted to be raised by an average 0.02% compared to the baseline price. As the baseline corn price remains stable at a higher level than the historical price, there is no likelihood for PLC or ARC to be triggered.

Total Planted Acres

The forecast results demonstrate that the U.S. total planted acres of corn would increase compared to those under the baseline by an average of 0.18% under the 2014 Farm Bill during 2013-2022 (figure B-217).

Production

The forecast results indicate that the U.S. total corn production would slightly increase compared to that of the baseline by an average of 0.15% during 2013-2022 (figure B-218). Because the estimates for harvest acres and expected yields are unchanged, the changes in production strongly depend on the changes in planted acres.

Demand

Under the 2014 Farm Bill, the U.S. corn total demand is forecasted to remain almost unchanged during 2013-2022. Under implementation of PLC and ARC, the increments of total corn demand are forecasted to average 0.12%. The tiny demand changes mainly come from the small changes in the corn price (figure B-219).

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of ENRs in the Corn Belt, the Central Plains, and the North East is compared. More detailed information on regional corn ENRs changes is available in Appendix D. The 2014 Farm Bill is forecasted to reduce the average corn ENRs by an average of 2.88% during 2013-2022 (figure B-220).

Barley

National Equilibrium Price

Compared to the baseline, the 2014 Farm Bill is forecasted to raise the U.S. national barley price by an average of 0.35% during 2013-2022 (figure B-221). As the baseline barley prices are forecasted to rise over time, there is no room for PLC or ARC to be triggered.

Total Planted Acres

The forecast results indicate that the U.S. barley total planted acres would decrease compared to baseline by an average of 0.08% during 2013-2022 (figure B-222). Eliminating DP and CCP reduces the planted acre via lower ENRs.

Production

The forecast results demonstrate that the U.S. barley total production would decrease compared to the baseline by an average of 0.09% during 2013-2022 (figure B-223). Since the estimates for harvest acres and expected yields are unchanged, the changes in production depend on the changes in planted acres.

Demand

Under the 2014 Farm Bill, the U.S. barley total demand is forecasted to decrease slightly, averaging 0.09% during 2013-2022 (figure B-224). The tiny demand changes mainly come from the small changes in the barley price.

Expected Net Returns (ENRs)

A simple average the barley ENRs changes in the Far West and the Northern Plains is presented in figure B-225. The elimination of DP is expected to lower the average barley ENRs. Consequently, the average ENRs are forecasted to decrease by an average of 4.40% during 2013-2022.

Cotton

When analyzing the impacts of income support programs on the U.S. cotton sector, it is necessary to consider that this study does not include newly suggested provisions for cotton, e.g., Stacked Income Protection Plan (STAX) and Supplemental Coverage Option (SCO).

National Equilibrium Price

Compared to the baseline, the U.S. national cotton price is forecasted to be lower under the 2014 Farm Bill. The cotton price is forecasted to be lower by an average of 0.74% during 2013-2022 (figure B-226). Also, the cotton price is forecasted to reach its peak in 2014 followed by continuous declining.

Total Planted Acres

The forecast results indicate that the U.S. cotton total planted acres would remain almost unchanged under the 2014 Farm Bill. The average cotton planted acres are forecasted to decrease by 0.21% during 2013-2022 (figure B-227). The planted acre changes are subject to the ENRs changes which depend on the presence of the new programs not considered in this study.

Production

The forecast results indicate that the U.S. cotton total production would decrease by an average of 0.28% under the 2014 Farm Bill during 2013-2022 (figure B-228).

Because the estimates for harvest acres and expected yields are unchanged, the changes in production solely depend on the changes of planted acres. Increments in expected yields over time have the magnitude of production reduction larger than the changes in planted acres.

Demand

The new farm income support provisions are forecasted to reduce the U.S. cotton milling and export demand during 2013-2022. Under the 2014 Farm Bill, the U.S. cotton total demand is forecasted to decrease, by an average of 0.23% during 2013-2022 (figure B-229). Throughout the forecast period, the higher cotton price combined with continuous decrease in the historical demand will cause the domestic milling demand to decrease by an average of 1.12%. On the other hand, the export demand is forecasted to experience less reduction, averaging 0.21%.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the cotton ENRs in the Delta States, the Far West, the South East, and the Southern Plains is compared. More detailed information on regional cotton ENRs changes is available in Appendix D.

Changes in the average cotton ENRs under the 2014 Farm Bill are in line with theoretical expectations. The higher cotton price is forecasted to partially compensate the revenue reduction due to elimination of DP and CCP. As a result, the average cotton ENRs is forecasted to decrease by an average of 1.55% during 2013-2022 (figure B-230).

Oats

National Equilibrium Price

Compared to the baseline, implementation of PLC and ARC is forecasted to have relatively large impacts on the U.S. oat national average price during 2013-2022. On average, the oat price is forecasted to decline by 3.64% under the 2014 Farm Bill during 2013-2022 (figure B-231).

Total Planted Acres

The forecast results indicate that the U.S. oat total planted acres would remain stable with an average increment of 0.59% during 2013-2022 (figure B-232). As ARC is sporadically triggered, oat producers are forecasted to have the incentives to maintain or expand the planted acres in spite of the lower oat price.

Production

The forecast results indicate that the U.S. oat total production would increase by an average of 1.67% under the 2014 Farm Bill during 2013-2022 (figure B-233). As the estimates for harvest acres and expected yields for oats remain unchanged, the oat production increments mainly come from the expanded planted acres.

Demand

Under the alternative income support programs, the U.S. oat total demand is forecasted to increase by an average of 4.29% during 2013-2022 (figure B-234). For all of the sub-demand categories, oat demand is forecasted to increase over time. The oat seed and feed demand is forecasted to increase by an average of 0.36% during 2013-2022. The largest average increment of 8.17% is forecasted for the oat feed demand. In contrast, relatively small average increments are forecasted for the food (1.33%) and export demand (1.05%) for the same period.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of ENRs in the Far West, the Lake States, the Northern Plains, and the Southern Plains is compared. More detailed information on regional oat ENRs changes is available in Appendix D.

The average oat ENRs under the 2014 Farm Bill are smaller than under the baseline by an average of 2.00% during 2013-2022 (figure B-235). Occasional triggering of ARC is forecasted to partially mitigate the ENRs reductions.

Long Grain (LG) Rice

National Equilibrium Price

Compared to the baseline, the 2014 Farm Bill is forecasted to raise the U.S. national LG rice price by an average of 2.61% during 2013-2022 (figure B-236). As the rice price is forecasted to remain substantially high, no PLC or ARC will be triggered.

Total Planted Acres

The forecast results indicate that the U.S. LG rice total planted acres would decrease by an average of 1.33% under the 2014 Farm Bill during 2013-2022 (figure B-237). The planted acre decrease is due to lower ENRs forecasted under the 2014 Farm Bill.

Production

The forecast results indicate that the U.S. total LG rice production would decrease by an average of 1.56% under the 2014 Farm Bill during 2013-2022 (figure B-238). This decrement is mainly due to the change in the planted acres.

Demand

Under the 2014 Farm Bill, the U.S. LG rice total demand is forecasted to decrease by an average of 0.89% during 2013-2022 (figure B-239). The higher price is forecasted to decrease both domestic and export demand. The increasing trends for the domestic demand are forecasted to offset the price effects such that the average domestic demand is forecasted to decrease only by 0.58% during 2013-2022. In contrast, the LG rice export demand is forecasted to experience a larger decrement, averaging 1.61% over the same period.

Expected Net Returns (ENRs)

For illustrative purpose, the LG rice ENRs in the Delta States is compared. The ENRs under the 2014 Farm Bill are forecasted to be lower compared to the baseline. Because none of PLC or ARC is forecasted to trigger, the average ENRs are forecasted to lower by 8.18% during 2013-2022, on average (figure B-240).

Medium/Short Grain (MSG) Rice

National Equilibrium Price

Compared to the baseline, the 2014 Farm Bill is forecasted to cause the U.S. national MSG rice price to be higher than the baseline price by an average of 0.43% during 2013-2022 (figure B-241). The price changes are smaller than those for LG rice (2.61%). As the MSG rice price is forecasted to remain substantially high, no PLC or ARC will be triggered.

Total Planted Acres

The forecast results indicate that the U.S. MSG rice total planted acres would reduce by an average of 3.55% during 2013-2022 (figure B-242). Like LG rice, the higher prices are not sufficient to cover the revenue loss due to elimination of DP.

Production

The forecast results indicate that the U.S. MSG rice total production would decrease by 3.07% under the 2014 Farm Bill during 2013-2022, on average (figure B-243). This decrement is mainly due to the changes in the planted acres.

Demand

Under the 2014 Farm Bill, the U.S. LG rice demand is forecasted to increase by an average 0.19% during 2013-2022 (figure B-244). On the domestic demand side, increasing annual trends are forecasted to overwhelm the own price effects such that the domestic demand is forecasted to increase by 0.60%, on average. In contrast, the export demand is forecasted to experience a decrease of 0.24% over the same period, on average.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the MSG rice ENRs in the Delta States and the Far West is compared. The average ENRs under the 2014 Farm Bill are forecasted to be lower than the baseline during 2013-2022 (figure B-245). Since neither PLC nor ARC is forecasted to trigger, the average ENRs are forecasted to be lower by an average of 8.80% during 2013-2022.

Sorghum

National Equilibrium Price

Compared to the baseline, introduction of PLC and ARC are forecasted to have little impact on the national equilibrium sorghum prices. The national sorghum price is forecasted to be higher by an average of 0.53% under the 2014 Farm Bill during 2013-2022 (figure B-246).

Total Planted Acres

The forecast results indicate that the U.S. sorghum total planted acres would be smaller compared to the baseline. Under the 2014 Farm Bill, the planted acres are projected to decrease by an average of 0.70% during 2013-2022 (figure B-247). At the regional level, the planted acres are forecasted to remain unchanged in the Central Plains whereas an average of 1.57% decrement is expected in the Southern Plains.

Production

The forecast results indicate that the U.S. sorghum total production would decrease by an average of 0.55% under the 2014 Farm Bill during 2013-2022 (figure B-248). As the estimates for the wheat harvested acres and expected yields remain unchanged during the forecast period, the production changes are mainly due to the changes in the planted acres.

Demand

Under the 2014 Farm Bill, the U.S. sorghum total demand is forecasted to decrease by an average of 0.52% during 2013-2022 (figure B-249). The largest decreases are forecasted in the food demand (1.27%) during 2013-2022. The sizes of average decrease in the feed demand (0.39%) and the export demand (0.42%) are similar.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the sorghum ENRs in the Central Plains and the Southern Plains is compared. The average ENRs under the 2014 Farm Bill are forecasted to be lower than under the baselines. In spite of the higher prices, elimination of DP is forecasted to lower the average ENRs by 9.94% during 2013-2022 (figure B-250).

Soybeans

National Equilibrium Price

Compared to the baseline, the 2014 Farm Bill is forecasted to lower the U.S. soybean price by an average of 0.82% during 2013-2022 (figure B-251). As the forecasted soybean prices and ACR remain higher compared to the reference prices and BCR, there no PLC or ARC will be triggered.

Total Planted Acres

The forecast results indicate that the U.S. soybean total planted acres would increase by an average of 0.10% during 2013-2022, compared to the baseline (figure B-252).

Production

The forecast results indicate that the U.S. soybean total production would increase by an average of 0.09% under the 2014 Farm Bill during 2013-2022 (figure B-253). The changes in production are mainly due to the changes in planted acres.

Demand

Under the 2014 Farm Bill, the U.S. soybean total demand is forecasted to increase by an average of 0.08% during 2013-2022 (figure B-254). Also, crushing (0.08%) and export (0.02%) demands are forecasted to increase. Under PLC and ARC, the soybean crushing margins are forecasted to increase by 3.45~3.61% during 2013-2022 (figure B-255).

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the soybean ENRs in the Corn Belt, the Central Plains, the Lake States, and the Northern Plains is compared. The average ENRs under the 2014 Farm Bill are forecasted to be lower than the baseline by an average of 3.32% during 2013-2022 (figure B-256).

Soybean Meal

National Equilibrium Price

Compared to the baseline, the national equilibrium soybean meal prices are forecasted to be lower by an average of 0.52% during 2013-2022 (figure B-257). As discussed earlier, the improved soybean crushing margins will lead to larger production of soybean meal and oil. The soybean meal price is forecasted to decrease with other things being equal.

Production

The forecast results indicate that the U.S. soybean meal total production would increase by an average of 0.08% compared to the baseline during 2013-2022 (figure B-258). These changes come from the increased soybean crushing demand as soybean meal production is assumed to be proportional to the quantity of soybeans used for crushing.

Demand

The forecasted increment of the soybean meal total demand under the 2104 Farm Bill averages 0.08% during 2013-2022 (figure B-259). The increment effects are more striking for the export demand (0.21%, on average) than the domestic demand (0.05%, on average).

Soybean Oil

National Equilibrium Price

Compared to the baseline, the lower national equilibrium soybean oil prices by an average of 0.34% are forecasted under the 2014 Farm Bill during 2013-2022 (figure B-260). Compared to the changes under the RFS2 implementation, the soybean oil price changes are relatively small.

Production

The forecast results indicate that the U.S. soybean oil total production would increase by an average of 0.08% during 2013-2022 (figure B-261). The change comes from the increased soybean crushing demand in that the soybean meal production is assumed to be proportional to the quantity of soybeans used for crushing.

Demand

The forecasted increment of soybean oil total demand under the 2014 Farm Bill averages 0.07% during 2013-2022 (figure B-262). The increase effects are more striking for the export demand (0.33%, on average) than the domestic demand (0.07%, on average).

National Equilibrium Price

Compared to the baseline, the 2014 Farm Bill is forecasted to raise the U.S. national wheat price by an average of 1.05% during 2013-2022 (figure B-263). During the forecast period, no PLC or ARC will be triggered.

Total Planted Acres

The forecast results indicate that the U.S. wheat total planted acres would reduce under the 2014 Farm Bill. The planted acres are forecasted to decrease compared to the baseline by an average of 0.52% during 2013-2022 (figure B-264). The decreases are mainly due to wheat producers' switching to the major competing crops (corn and/or soybeans).

Production

The forecast results indicate that the U.S. wheat total production would decrease by an average of 0.38% under the 2014 Farm Bill during 2013-2022 (figure B-265). As the estimates for the wheat harvested acres and expected yields remain unchanged during the forecast period, changes in the wheat production is mainly due to changes in the planted acres.

Demand

The 2014 Farm Bill is forecasted to decrease the U.S. wheat total demand by an average of 0.27% compared to the baseline during 2013-2022 (figure B-266). The largest reduction is forecasted in the feed and residual demand, reduced by an average of 1.85% during 2013-2022. The food and export demand reduction from the baseline is forecasted to average 0.09% and 0.22% over the forecast period.

Expected Net Returns (ENRs)

For illustrative purpose, a simple average of the wheat ENRs in the Central Plains, the Northern Plains, and the Southern Plains is compared. Over the forecast period, neither PLC nor ARC is forecasted to be triggered to lower the ENRs by an average of 8.04% (figure B-267).

Peanuts

National Equilibrium Price

Compared to the baseline, the U.S. national peanut price is forecasted to be substantially independent of the 2014 Farm Bill. The peanut price is forecasted to lower by 0.03% during 2013-2022, on average (figure B-268). As the peanut prices are forecasted to stay higher than the reference price, PLC will not be triggered over the forecast period.

Total Planted Acres

The forecast results indicate that the U.S. peanut total planted acres would increase only by 0.02% during 2013-2022, on average (figure B-269). The tiny changes come from the fact that the planted acres of peanuts are mainly determined by the previously planted acres than the peanut ENRs as shown in Chapter IV.

Production

The forecast results indicate that the U.S. peanut total production would increase by 0.02% under the new farm support programs during 2013-2022, on average (figure B-270). The changes of production are mainly due to changes in planted acres.

Demand

As the peanut price is forecasted to be relatively independent of the 2014 Farm Bill program changes, little changes are forecasted for the U.S. peanut total demand. The total demand is forecasted to increase by 0.01% during 2013-2022, on average (figure B-271). A small increase in peanut crushing margins, averaging 0.16%, is forecasted to increase the crushing demand by 0.01%, on average. Larger changes are forecasted in the export demand which is forecasted to decrease by 0.22% during 2013-2022, on average.

Expected Net Returns (ENRs)

For illustrative purpose, the peanut ENRs in the South East are compared. The average ENRs under the 2014 Farm Bill are forecasted to reduce by 6.96% during 2013-2022, on average (figure B-272).

Ethanol

The program provisions considered in this study do not include those relevant to the renewable energy sector. In this sense, it is unlikely that forecasting outcomes under the 2014 Farm Bill scenario would substantially differ from those under the baseline.

National Equilibrium Price

Under the 2014 Farm Bill programs, the representative ethanol price in Omaha, Nebraska is forecasted to be higher compared to the baseline by an average of 0.11% during 2013-2022 (figure B-273).

Production

Under the 2014 Farm Bill programs, the U.S. domestic ethanol production is forecasted to decrease by an average of 0.04% during 2013-2022 (figure B-274).

Demand

Under the 2014 Farm Bill programs, the U.S. ethanol domestic and export demands are forecasted to decrease by an average of 0.04% during 2013-2022 (figure B-275).

Biodiesel

The program provisions considered in this study do not include those relevant with the renewable energy sector. In this sense, it is unlikely that forecasting outcomes under the 2014 Farm Bill scenario would substantially differ from those under the baseline.

National Equilibrium Price

Under the 2014 Farm Bill, the U.S. biodiesel price is forecasted to decline compared to the baseline by 0.20% during 2013-2022 (figure B-276).

Production

Under the 2014 Farm Bill, the U.S. biodiesel domestic production is forecasted to increase compared to the baseline by an average of 0.01% during 2013-2022 (figure B-277).

Demand

Under the 2014 Farm Bill, the U.S. biodiesel domestic and export demands are forecasted to increase by an average of 0.01% during 2013-2022 (figure B-278).

Measurements of Changes in Welfare and Policy Implications

Under the 2014 Farm Bill, the approximation of welfare changes indicates that the PS is forecasted to decrease at an average of about $122 million while improving the CS by about $67 million during 2013-2022, on average (table C-106). The PS reduction can be attributed the elimination of DP which is forecasted to reduce ENRs. Especially, producers of cotton (-6.40% compared to the average baseline ENRs), LG rice (-8.17%), MSG rice (-8.78%), sorghum (-9.91%), and wheat (-8.02%) are forecasted to experience the lower ENRs under the 2014 Farm Bill. As discussed in Chapter V, the dependence on farm programs is relatively higher for these crops. Out of the major covered commodities, corn and wheat producers are forecasted to benefit from the higher prices under the proposed Farm Bills. In contrast, the lower prices of soybeans and by-products are forecasted to reduce the welfare of soybean producers. In the cotton sector, it can be found that the PS change is much larger than the CS change because of not considering the welfare transferred to foreign consumers. As the specific coverage program designed for cotton is not considered in this study, the welfare changes relevant to the cotton sector are a subject for future study.

Comparing the Forecast Result with Other Studies

Elimination of DP and CCP is expected to contribute to the budget reduction where the new provisions are expected to increase the government expenditures when triggered. The expected changes in the government expenditures estimated by this study and the Congressional Budget Office (CBO 2014) are summarized in table C-107. This study indicates that PLC payments are forecasted to be continuously triggered under the 2014 Farm Bill throughout 2015-2022. The 2014 Farm Bill is forecasted to satisfy one of the largest goals, budget reduction. A large surplus reduction is forecasted for soybean producers and the consumers of corn and wheat.

The estimated budget reduction by the 2014 Farm Bill this study and CBO (2014) cannot be directly compared because CBO (2014) has not considered the enacted version of the Farm Bill. Nevertheless, it can be demonstrated that the introduction of the 2014 Farm Bill is expected to substantially decrease the program payments for farm income support. Regarding the expected budget reductions resulting from repealing DP and CCP, this study and the CBO (2014) reach very similar magnitudes. However, when estimating the expected outlay for PLC and/or ARC, the two studies provide largely different estimates. The difference may be due to the possible difference of model used by each study and higher forecasted prices under this study compared to what was used by the CBO. In spite of the difference, both studies support the fact that the 2014 Farm Bill is forecasted to satisfy one of the largest goals, budget reduction. The comparison of the forecast results by this study and FAPRI (2014) is presented in table C-108.

CHAPTER IX

SUMMARY AND CONCLUSION

When conducting economic impact analysis, many of previous studies focus on either multiple crops in a region (nation) or a single crop in multiple regions. This approach oftentimes leaves other relevant crops or regions as exogenous with respect to the commodity of interest. In this sense, this study's model has an advantage of avoding potential problems caused by such an assumption.

The first part of this study concentrates on the theoretical grounds to build the U.S. crop sector model. A plausible theory is to be desired when accounting for producers' decision making in response to external changes and the supply-demand structure embedded in the entire sector. The concept of expected net returns (ENRs) centers on the specification and estimation of the proposed model. The conept is used to simultaneously capture the planting decisions under the expected changes and competition between crops within the same region. The structure of the individual commodity sector combined with the interaction between the individual sectors is reflected in the model to allow the entire system to be robust.

The model validation results demonstrate that the proposed model reasonably fits the historical data. The model has a limitation in forecasting because it fails to have such relevant and important factors as the U.S. livestock sector, the global market, and weather conditions endogenous.

The baseline forecast results, under the absence of any external shocks, indicate that the price, planted acres, production, demand, and ENRs for most commodities will be stabilized around 2014-2016. The late advent of stabilization is partially due to the aftermaths of the exceptionally high prices during the mid and late 2000s and droughts in recent years. Based on the forecast results, this study attempts to analyze the economic impacts of exchange rate changes, renewable fuel policy (RFS2), and the 2014 Farm Bill on the U.S. crop sector. The exchange rate changes and the RFS2 are expected to exert their impacts mainly on the demand side, whereas the 2014 Farm Bill will largely affect the supply side via changing the ENRs.

As expected the depreciation and appreciation of U.S. currency are forecasted to benefit the domestic producers and consumers. The impacts of the exchange rate changes are forecasted to be substantial, but vary by crop. Also, the currency depreciation is forecasted to have moderately larger overall impacts than the appreciation in terms of welfare changes. As will be mentioned later, incoporating the welfare changes in the ROW can substantially affect the magnitudes of total welfare changes. Despite the fact that the exchange rate changes are expected to have substantial impacts on the crop sector, the presence of international agreements and bodies such as WTO limits the extent to which the government can intervene.

Among the three external shocks analyzed in this study, the RFS2 is forecasted to have the largest impacts, especially on the corn and soybean sectors. Compared to the absecce of the renewable fuel policy, the RFS2 is forecasted to raise the prices of all the crops considered in this study, and work to further increase the planted acre share of corn and soybeans. Even when only confined to the total producer surplus increments are expected to exceed the total consumer surplus loss by an average of $38.3 billion. However, the forecasted net welfare loss due to higher fuel prices is forecasted to be much larger than the net gains in the agricultural sector. It implies that another approach may be required to compensate the consumer loss and mitigate the welfare loss for the entire society.

Implementation of the 2014 Farm Bill has a number of important implications. First, repealing the previous provisions (especially DP) is expected to reduce producers' ENRs and thus is likely to decrease producer surplus. Second, in spite of the lowered ENRs, only small changes are forecasted for planted acre allocations. Westcott and Young (2012) argued, "decoupled payments do not have direct effects on production decisions or agricultural output because they do not change returns to production." Third, the new Farm Bill is expected to drive the producers to be more sensitive to market signals. The likelihood of being more vulnerable to any unfavorable changes will increase in spite of the introduction of the new 'safety net' programs. Forth, the 2014 Farm Bill is forecasted to meet the initially intended goal of federal budget deficit reductions.

The impact analysis can be applied to most major crops at the national and regional level. This nested information is expected to benefit the policy makers in their decision making. This study can not be free from some caveats or weakness in terms of assumptions and analysis approaches. First, failure to include some relevant programs such as CRP and ACRE may have the forecasted results depart from what they would otherwise be. Second, the assumption of having the U.S. livestock sector and global market exogenous prevents this study from fully capturing the expected responses or feedbacks from the sectors. This assumption also imposes a limitation on analyzing the welfare measurements including those sectors. Third, when analyzing the impacts of exchange rate changes, incoporating the embedded fluctuation risks and commodity-specific exchange rates might improve the reliability of the model. Fourth, regaring the RFS2 implementation, considering blending wall issue and others regulations such as Renewable Identification Number (RIN) would be desirable. Fith, the 2014 Farm Bill provision analyzed in this study does not encompass the nutrition programs which accounts for the largest portion of the budget outlay. As the programs are expected to affect the demand side, further analysis with the nutrition programs is necessary. All of the weaknesses of this study mentioned above remain as future works.

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APPENDIX A

DATA DESCRIPTION

Appendix A contains all of the relevant data used for the estimation, introduced in Chapter IV and Appendix C. Such data are available on request. Table A-1 contains variable name, description, units, and data sources. Table A-2 introduces the historical data for each variable. Many of the entire data in this study's model are used to generate other data used in the estimation, and are not presented in the tables. The data are available on request.

Table A-1. Variable Description

Variable Name	Description	Units	Source
BACRNP	Barley-Corn ENRs Ratio in Northern Plains	Index	Calculated
BACRRP	Barley Price Relative to Corn Price	Index	Calculated
BAEXD1	Year Dummy (= 1 in 1996, 1998, and 1999, 0 otherwise)	Index	
BAFWFP	Barley Farm Price in Far West	US$ per Bushel	NASS
BAFWHA	Barley Harvested Acres in Far West	Million Acres	NASS
BAFWPA	Barley Planted Acres in Far West	Million Acres	NASS
BAFWPA_LEAD1	Barley Planted Acres in Far West (Led)	Million Acres	NASS
BAFWYLE	Expected Barley Yield in Far West	Bushels per Acre	Calculated
BANPHA	Barley Harvested Acres in Northern Plains	Million Acres	NASS
BANPPA	Barley Planted Acres in Northern Plains	Million Acres	NASS
BANPPA_LEAD1	Barley Planted Acres in Northern Plains (Led)	Million Acres	NASS
BANPYLE	Expected Barley Yield in Northern Plains	Bushels per Acre	Calculated
BASORP	Barley Price Relative to Sorghum Price	Index	Calculated
BAUSPR	Barley Total Production	Million Bushels	USDA ERS, Feed Grain Yearbook Table 1
BAUSRFP	Barley Average Farm Price (Real)	US$ per Bushel	USDA ERS, Feed Grain Yearbook Table 14
BAUSSE	Barley Seed Use	Million Bushel	USDA ERS, Feed Grain Yearbook Table 6
BAWHFW	Barley-Wheat ENRs Ratio in Far West	Index	Calculated
BD100RP	BD100 Retail Price (National Average, Real)	US$ per Gallon	EIA, Alternative Fuels Data Center
BDEXN	Bio Diesel Net Exports	Thousand Gallons	EIA, Annual Energy Review, Table 10.4
BDEXN_LAG1	Bio Diesel Net Exports (Lagged)	Thousand Gallons	EIA, Annual Energy Review, Table 10.4
BDOPMRR	Biodiesel Operation Margin (Real)	US$ per Gallon	Calculated
BDSLPR	Biodiesel Production from Soybean Oil	Thousand Gallons	EIA, Total Energy Table 10.4
BDUSDE	Biodiesel Domestic Use	Thousand Gallons	EIA, Total Energy Table 10.4
CLUSMP	Corn Oil Price (Chicago)	US$ per Pound	USDA ERS, Oil Crop Yearbook Table 32
COCRDS	Cotton-Corn ENRs Ratio in Delta States	Index	Calculated
CODSFP	Cotton Farm Price in Delta States	US$ per Pound	NASS
CODSHA	Cotton Harvested Acres in Delta States	Million Acres	NASS
CODSPA	Cotton Planted Acres in Delta States	Million Acres	NASS
CODSPA_LEAD1	Cotton Planted Acres in Delta States (Led)	Million Acres	NASS
CODSPAD1	Year Dummy (= 1 in 2001, 2006, 2007, and 2011)	Index	None

Table A-1 (Continued)

Variable Name	Description	Units	Source
CODSYLD1	Year Dummy (= 1 in 2004, 2007, and 2012, 0 otherwise)	Index	None
CODSYLE	Expected Cotton Yield in Delta States	Pounds per Acre	Calculated
COFWFP	Cotton Farm Price in Far West	US$ per Pound	NASS
COFWHA	Cotton Harvested Acres in Far West	Million Acres	NASS
COFWPA	Cotton Planted Acres in Far West	Million Acres	NASS
COFWPA_LEAD1	Cotton Planted Acres in Far West (Led)	Million Acres	NASS
COFWYLD1	Year Dummy (= 1 in 2004, 2007, and 2012, 0 otherwise)	Index	None
COFWYLE	Expected Cotton Yield in Far West	Pounds per Acre	Calculated
COPESE	Cotton-Peanut ENRs Ratio in South East	Index	Calculated
COSBDS	Cotton-Soybean ENRs Ratio in Delta States	Index	Calculated
COSEFP	Cotton Farm Price in South East	US$ per Pound	NASS
COSEHA	Cotton Harvested Acres in South East	Million Acres	NASS
COSEPA	Cotton Planted Acres in South East	Million Acres	NASS
COSEPA_LEAD1	Cotton Planted Acres in South East (Led)	Million Acres	NASS
COSEYLD1	Year Dummy (= 1 in 1994, 1996, and 2002, 0 otherwise)	Index	None
COSEYLD2	Year Dummy (= 1 in 2008, 2009, and 2012)	Index	None
COSEYLE	Expected Cotton Yield in South East	Pounds per Acre	Calculated
COSPFP	Cotton Farm Price in Southern Plains	US$ per Pound	NASS
COSPHA	Cotton Harvested Acres in Southern Plains	Million Acres	NASS
COSPHAD1	Year Dummy (= 1 in 2006, 2008, 2009, and 2011)	Index	None
COSPHAD2	Year Dummy (= 1 in 1992, 1996, 1998, and 2000, 0 otherwise)	Index	None
COSPPA	Cotton Planted Acres in Southern Plains	Million Acres	NASS
COSPPA_LEAD1	Cotton Planted Acres in Southern Plains (Led)	Million Acres	NASS
COSPPAD1	Year Dummy (= 1 in 2006-2008, and 2012, 0 otherwise)	Index	None
COSPPAD2	Year Dummy (= 1 in 1985, 1986, and 1988, 0 otherwise)	Index	None
COSPYLE	Expected Cotton Yield in Southern Plains	Bushels per Acre	Calculated
COUSMI	Cotton Mill Use	Million Pounds	USDA ERS, Cotton and Wool Yearbook Table 2
COUSRFP	Cotton Average Farm Price (Real)	US$ per Pound	USDA ERS, Cotton and Wool Yearbook Table 11
CRBAFW	Corn-Barley ENRs Ratio in Far West	Index	Calculated
CRCBFP	Corn Farm Price in Corn Belt	US$ per Bushel	NASS

Table A-1 (Continued)

Variable Name	Description	Units	Source
CRCBHA	Corn Harvested Acres in Corn Belt	Million Acres	NASS
CRCBPA	Corn Planted Acres in Corn Belt	Million Acres	NASS
CRCBPA_LEAD1	Corn Planted Acres in Corn Belt (Led)	Million Acres	NASS
CRCBYLD1	Year Dummy (= 1 in 1988, 1991, 1993, and 1995, 0 otherwise)	Index	None
CRCBYLE	Expected Corn Yield in Expected Corn Belt	Bushels per Acre	Calculated
CRCOSP	Corn-Cotton ENRs Ratio in Southern Plains	Index	Calculated
CRCPFP	Corn Farm Price in Central Plains	US$ per Bushel	NASS
CRCPHA	Corn Harvested Acres in Central Plains	Million Acres	NASS
CRCPPA_LEAD1	Corn Planted Acres in Central Plains	Million Acres	NASS
CRCPYLE	Expected Corn Yield in Central Plains	Bushels per Acre	Calculated
CRDSFP	Corn Farm Price in Delta States	US$ per Bushel	NASS
CRDSHA	Corn Harvested Acres in Delta States	Million Acres	NASS
CRDSPA	Corn Planted Acres in Delta States	Million Acres	NASS
CRDSPA_LEAD1	Corn Planted Acres in Delta States (Led)	Million Acres	NASS
CRDSYLE	Expected Corn Yield in Delta States	Bushels per Acre	Calculated
CREX	Corn Exports	Million Bushels	USDA ERS, Feed Grain Yearbook Table 4
CREXD1	Year Dummy (= 1 in 1993, 1997, and 2002, 0 otherwise)	Index	None
CRFWFP	Corn Farm Price in Far West	US$ per Bushel	NASS
CRFWHA	Corn Harvested Acres in Far West	Million Acres	NASS
CRFWPA	Corn Planted Acres in Far West	Million Acres	NASS
CRFWPA_LEAD1	Corn Planted Acres in Far West (Led)	Million Acres	NASS
CRFWYLE	Expected Corn Yield in Far West	Bushels per Acre	Calculated
CRLSFP	Corn Farm Price in Lake States	US$ per Bushel	NASS
CRLSHA	Corn Harvested Acres in Lake States	Million Acres	NASS
CRLSPA	Corn Planted Acres in Lake States	Million Acres	NASS
CRLSPA_LEAD1	Corn Planted Acres in Lake States (Led)	Million Acres	NASS
CRLSYLE	Expected Corn Yield in Lake States	Bushels per Acre	Calculated
CRNEFP	Corn Farm Price in North East	US$ per Bushel	NASS
CRNEHA	Corn Harvested Acres in North East	Million Acres	NASS
CRNEPA	Corn Planted Acres in North East	Million Acres	NASS

Table A-1 (Continued)

Variable Name	Description	Units	Source
CRNEPA_LEAD1	Corn Planted Acres in North East (Led)	Million Acres	NASS
CRNEYLE	Expected Corn Yield in North East	Bushels per Acre	Calculated
CRNPFP	Corn Farm Price in Northern Plains	US$ per Bushel	NASS
CRNPHA	Corn Harvested Acres in Northern Plains	Million Acres	NASS
CRNPPA_LEAD1	Corn Planted Acres in Northern Plains (Led)	Million Acres	NASS
CRNPYLD1	Year Dummy (= 1 in 1988, 1993, and 1995, 0 otherwise)	Index	None
CRNPYLE	Expected Corn Yield in Northern Plains	Bushels per Acre	Calculated
CROALS	Corn-Oat ENRs Ratio in Lake States	Index	Calculated
CROANP	Corn-Oat ENRs Ratio in Northern Plains	Index	Calculated
CRSBCB	Corn-Soybean ENRs Ratio in Corn Belt	Index	Calculated
CRSBCP	Corn-Soybean ENRs Ratio in Central Plains	Index	Calculated
CRSBDS	Corn-Soybean ENRs Ratio in Delta States	Index	Calculated
CRSBLS	Corn-Soybean ENRs Ratio in Lake States	Index	Calculated
CRSBNE	Corn-Soybean ENRs Ratio in Northern Plains	Index	Calculated
CRSBNP	Corn-Soybean ENRs Ratio in Northern Plains	Index	Calculated
CRSBSE	Corn-Soybean ENRs Ratio in South East	Index	Calculated
CRSEFP	Corn Farm Price in South East	US$ per Bushel	NASS
CRSEHA	Corn Harvested Acres in South East	Million Acres	NASS
CRSEPA	Corn Planted Acres in South East	Million Acres	NASS
CRSEPA_LEAD1	Corn Planted Acres in South East (Led)	Million Acres	NASS
CRSEPAD1	Year Dummy (= 1 in 2006 and 2011-2012, 0 otherwise)	Index	None
CRSEYLD1	Year Dummy (= 1 in 2001, 2004, and 2009, 0 otherwise)	Index	None
CRSEYLD2	Year Dummy (= 1 in 1988, 1990, and 1993, 0 otherwise)	Index	None
CRSEYLE	Expected Corn Yield in South East	Bushels per Acre	Calculated
CRSOSP	Corn-Sorghum ENRs Ratio in Southern Plains	Index	Calculated
CRSPFP	Corn Farm Price in Southern Plains	US$ per Bushel	NASS
CRSPHA	Corn Harvested Acres in Southern Plains	Million Acres	NASS
CRSPPA	Corn Planted Acres in Southern Plains	Million Acres	NASS
CRSPPA_LEAD1	Corn Planted Acres in Southern Plains (Led)	Million Acres	NASS
CRSPYLD1	Year Dummy (= 1 in 1997, 1999, and 2004, 0 otherwise)	Index	None

Table A-1 (Continued)

Variable Name	Description	Units	Source
CRSPYLE	Expected Corn Yield in Southern Plains	Bushels per Acre	Calculated
CRUSFE	Corn Feed and Residuals Use	Million Bushels	USDA ERS, Feed Grain Yearbook Table 4
CRUSFI	Corn Food, and Industrial Use (Excluding Alcohol Use)	Million Bushels	USDA ERS, Feed Grain Yearbook Table 4 and 31
CRUSPA_LEAD1	Corn Total Planted Acres (Led)	Million Acres	USDA ERS, Feed Grain Yearbook Table 1
CRUSPR	Corn Total Production	Million Bushels	USDA ERS, Feed Grain Yearbook Table 1
CRUSRFP	Corn Average Farm Price (Real)	US$ per Bushel	USDA ERS, Feed Grain Yearbook Table 12
CRUSSE	Corn Seed Use	Million Bushel	USDA ERS, Feed Grain Yearbook Table 4
CSUSRP	Cottonseed Oil Price, Valley Points (Real)	US$ per Pound	USDA ERS, Oil Crop Yearbook Table 19
D00	Year Dummy (= 1 in 2000, 0 otherwise)	Index	None
D0001	Year Dummy (= 1 in 2000-2001, 0 otherwise)	Index	None
D0007	Year Dummy (= 1 in 2000-2007, 0 otherwise)	Index	None
D0096	Year Dummy (= 1 in 1996 and 2000, 0 otherwise)	Index	None
D01	Year Dummy (= 1 in 2001, 0 otherwise)	Index	None
D0102	Year Dummy (= 1 in 2001 and 2002, 0 otherwise)	Index	None
D0103	Year Dummy (= 1 in 2001 through 2003, 0 otherwise)	Index	None
D0106	Year Dummy (= 1 in 2001-2006, 0 otherwise)	Index	None
D02	Year Dummy (= 1 in 2002, 0 otherwise)	Index	None
D0200	Year Dummy (= 1 in 2000 and 2002, 0 otherwise)	Index	None
D0203	Year Dummy (2002-2003 = 1, 0 otherwise)	Index	None
D0205	Year Dummy (= 1 in 2002-05, 0 otherwise)	Index	None
D0206	Year Dummy (= 1 in 2002-06, 0 otherwise)	Index	None
D0299	Year Dummy (= 1 in 1999 and 2002, 0 otherwise)	Index	None
D03	Year Dummy (= 1 in 2003, 0 otherwise)	Index	None
D0300	Year Dummy (= 1 in 2000 and 2003, 0 otherwise)	Index	None
D0304	Year Dummy (= 1 in 2003 and 2004, 0 otherwise)	Index	None
D0306	Year Dummy (= 1 in 2003-2006, 0 otherwise)	Index	None
D0309	Year Dummy (= 1 in 1994-1995, 0 otherwise)	Index	None
D04	Year Dummy (= 1 in 2004, 0 otherwise)	Index	None
D0400	Year Dummy (= 1 in 2000 and 2004, 0 otherwise)	Index	None
D0405	Year Dummy (= 1 in 2004 and 2005, 0 otherwise, 0 otherwise)	Index	None

Table A-1 (Continued)

Variable Name	Description	Units	Source
D0407	Year Dummy (= 1 in 2004-07, 0 otherwise)	Index	None
D05	Year Dummy (= 1 in 2005, 0 otherwise)	Index	None
D0502	Year Dummy (= 1 in 2002 and 2005, 0 otherwise)	Index	None
D0503	Year Dummy (= 1 in 2003 and 2005, 0 otherwise)	Index	None
D0506	Year Dummy (= 1 in 2005 and 2006, 0 otherwise)	Index	None
D06	Year Dummy (= 1 in 2006, 0 otherwise)	Index	None
D0600	Year Dummy (= 1 in 2000 and 2006, 0 otherwise)	Index	None
D0602	Year Dummy (= 1 in 2002 and 2006, 0 otherwise)	Index	None
D0608	Year Dummy (= 1 in 2006-2008, 0 otherwise)	Index	None
D0609	Year Dummy (= 1 in 2006-09, 0 otherwise)	Index	None
D07	Year Dummy (= 1 in 2007, 0 otherwise)	Index	None
D0708	Year Dummy (= 1 in 2007 and 2008, 0 otherwise)	Index	None
D0711	Year Dummy (= 1 in 2007-2011, 0 otherwise)	Index	None
D08	Year Dummy (= 1 in 2008, 0 otherwise)	Index	None
D0810	Year Dummy (= 1 in 2008-2010, 0 otherwise)	Index	None
D0812	Year Dummy (= 1 in 2008-2012, 0 otherwise)	Index	None
D09	Year Dummy (= 1 in 2009, 0 otherwise)	Index	None
D0900	Year Dummy (= 1 in 2000 and 2009, 0 otherwise)	Index	None
D0907	Year Dummy (= 1 in 2007 and 2009, 0 otherwise)	Index	None
D0910	Year Dummy (2009 and 2010 = 1, 0 otherwise)	Index	None
D0911	Year Dummy (= 1 in 2009-2011, 0 otherwise)	Index	None
D0912	Year Dummy (= 1 in 2009-2012, 0 otherwise)	Index	None
D10	Year Dummy (= 1 in 2010, 0 otherwise)	Index	None
D1006	Year Dummy (= 1 in 2006 and 2010, 0 otherwise)	Index	None
D1007	Year Dummy (= 1 in 2007 and 2010, 0 otherwise)	Index	None
D1008	Year Dummy (= 1 in 2008 and 2010, 0 otherwise)	Index	None
D1012	Year Dummy (= 1 in 2010-2012, 0 otherwise)	Index	None
D11	Year Dummy (= 1 in 2011, 0 otherwise)	Index	None
D1106	Year Dummy (= 1 in 2006 and 2011, 0 otherwise)	Index	None
D1108	Year Dummy (= 1 in 2008 and 2011, 0 otherwise)	Index	None

Table A-1 (Continued)

Variable Name	Description	Units	Source
D12	Year Dummy (= 1 in 2012, 0 otherwise)	Index	None
D1209	Year Dummy (= 1 in 2009 and 2012, 0 otherwise)	Index	None
D1210	Year Dummy (= 1 in 2010 and 2012, 0 otherwise)	Index	None
D85	Year Dummy (= 1 in 1985, 0 otherwise)	Index	None
D8586	Year Dummy (= 1 in 1985 and 1986, 0 otherwise)	Index	None
D8587	Year Dummy (= 1 in 1985-1987, 0 otherwise)	Index	None
D86	Year Dummy (= 1 in 1986, 0 otherwise)	Index	None
D8687	Year Dummy (1986 and 1987 = 1, 0 otherwise)	Index	None
D8688	Year Dummy (= 1 in 1986-1988, 0 otherwise)	Index	None
D87	Year Dummy (= 1 in 1987, 0 otherwise)	Index	None
D8785	Year Dummy (= 1 in 1985 and 1987, 0 otherwise)	Index	None
D8788	Year Dummy (= 1 in 1987 and 1988, 0 otherwise)	Index	None
D88	Year Dummy (= 1 in 1988, 0 otherwise)	Index	None
D8885	Year Dummy (= 1 in 1985 and 1988, 0 otherwise)	Index	None
D8889	Year Dummy (= 1 in 1988 and 1989, 0 otherwise)	Index	None
D8891	Year Dummy (= 1 in 1988-1991, 0 otherwise)	Index	None
D8893	Year Dummy (= 1 in 1988-1993, 0 otherwise)	Index	None
D89	Year Dummy (= 1 in 1989, 0 otherwise)	Index	None
D8986	Year Dummy (= 1 in 1986 and 1989, 0 otherwise)	Index	None
D8990	Year Dummy (= 1 in 1989 and 1990, 0 otherwise)	Index	None
D8992	Year Dummy (= 1 in 1989-1992, 0 otherwise)	Index	None
D90	Year Dummy (= 1 in 1990, 0 otherwise)	Index	None
D9085	Year Dummy (= 1 in 1985 and 1990, 0 otherwise)	Index	None
D9086	Year Dummy (= 1 in 1986 and 1990, 0 otherwise)	Index	None
D9088	Year Dummy (= 1 in 1988 and 1990, 0 otherwise)	Index	None
D9097	Year Dummy (= 1 in 1990-1997, 0 otherwise)	Index	None
D91	Year Dummy (= 1 in 1991, 0 otherwise)	Index	None
D9194	Year Dummy (= 1 in 1991-94, 0 otherwise)	Index	None
D92	Year Dummy (= 1 in 1992, 0 otherwise)	Index	None
D9290	Year Dummy (= 1 in 1990 and 1992, 0 otherwise)	Index	None

Table A-1 (Continued)

Variable Name	Description	Units	Source
D9293	Year Dummy (= 1 in 1992 and 1993, 0 otherwise)	Index	None
D93	Year Dummy (= 1 in 1993, 0 otherwise)	Index	None
D9388	Year Dummy (= 1 in 1988 and 1993, 0 otherwise)	Index	None
D9391	Year Dummy (= 1 in 1991 and 1993, 0 otherwise)	Index	None
D9395	Year Dummy (= 1 in 1993-1995, 0 otherwise)	Index	None
D94	Year Dummy (= 1 in 1994, 0 otherwise)	Index	None
D9401	Year Dummy (= 1 in 1994-2001, 0 otherwise)	Index	None
D9485	Year Dummy (= 1 in 1985 and 1994, 0 otherwise)	Index	None
D9490	Year Dummy (= 1 in 1994 and 1990, 0 otherwise)	Index	None
D9492	Year Dummy (1992 and 1994 = 1, 0 otherwise)	Index	None
D9495	Year Dummy (= 1 in 1994-1995, 0 otherwise)	Index	None
D9496	Year Dummy (= 1 in 1994-96, 0 otherwise)	Index	None
D95	Year Dummy (= 1 in 1995, 0 otherwise)	Index	None
D9590	Year Dummy (= 1 in 1990 and 1995, 0 otherwise)	Index	None
D9591	Year Dummy (= 1 in 1991 and 1995, 0 otherwise)	Index	None
D9593	Year Dummy (= 1 in 1993 and 1995, 0 otherwise)	Index	None
D9596	Year Dummy (= 1 in 1995 and 1996, 0 otherwise)	Index	None
D9599	Year Dummy (= 1 in 1995-99, 0 otherwise)	Index	None
D96	Year Dummy (= 1 in 1996, 0 otherwise)	Index	None
D9689	Year Dummy (= 1 in 1989 and 1996, 0 otherwise)	Index	None
D9691	Year Dummy (= 1 in 1991 and 1996, 0 otherwise)	Index	None
D9694	Year Dummy (= 1 in 1994 and 1996, 0 otherwise)	Index	None
D9697	Year Dummy (= 1 in 1996 and 1997, 0 otherwise)	Index	None
D97	Year Dummy (= 1 in 1997, 0 otherwise)	Index	None
D9702	Year Dummy (= 1 in 1997-2002, 0 otherwise)	Index	None
D9794	Year Dummy (= 1 in 1994 and 1997, 0 otherwise)	Index	None
D98	Year Dummy (= 1 in 1998, 0 otherwise)	Index	None
D9800	Year Dummy (= 1 in 1998-2000, 0 otherwise)	Index	None
D9894	Year Dummy (= 1 in 1994 and 1998, 0 otherwise)	Index	None
D9895	Year Dummy (= 1 in 1995 and 1998, 0 otherwise)	Index	None

Table A-1 (Continued)

Variable Name	Description	Units	Source
D9896	Year Dummy (= 1 in 1996 and 1998, 0 otherwise)	Index	None
D9899	Year Dummy (= 1 in 1998 and 1999, 0 otherwise)	Index	None
D99	Year Dummy (= 1 in 1999, 0 otherwise)	Index	None
D9900	Year Dummy (= 1 in 1999 and 2000, 0 otherwise)	Index	None
D9902	Year Dummy (= 1 in 1999-2002, 0 otherwise)	Index	None
DDGMP	DDG Price (Lawrenceburg, IN)	Thousand US$ per Ton	USDA ERS, Feed Grain Yearbook Table 16
DMOPMRR	Dry Milling Operation Margin (Real)	US$ per Gallon	Calculated
ETDMPR	Ethanol Production from Dry Milling	Thousand Gallons	Calculated
ETEXN	Ethanol Net Exports	Thousand Gallons	EIA, Annual Energy Review, Table 10.3
ETUSDE	Ethanol Domestic Demand	Thousand Gallons	EIA, Annual Energy Review, Table 10.3
ETUSRP	Ethanol Rack Price (Omaha, NE, Real)	US$ per Gallon	Ethanol Average Rack Prices Table 1, NE
ETWMPR	Ethanol Production from Wet Milling	Thousand Gallons	Calculated
FBEXFB	F&B Expenditures, per capita (deflated by F&B CPI)	Thousand US$	USDA ERS, Food Expenditures Table 13
GCAU	Number of Grain-Consuming Animal Units (Exc. Poultry)	Million Heads	USDA ERS, Feed Grain Yearbook Table 30
GCCU	Number of Grain-Consuming Cattle Units	Million Heads	USDA ERS, Feed Grain Yearbook Table 30
GCDU	Number of Grain-Consuming Dairy Units	Million Heads	USDA ERS, Feed Grain Yearbook Table 30
GFUSMP	Gluten Feed Price (21% Protein, Midwest)	US$ per Pound	USDA ERS, Feed Grain Yearbook Table 16
GMUSMP	Gluten Meal Price (60% Protein, Midwest)	Thousand US$ per Ton	USDA ERS, Feed Grain Yearbook Table 16
LRDSER_LEAD1	LG Rice ENRs in Delta States (Led)	US$ per Acre	Calculated
LRDSFP	LG Rice Farm Price in Delta States	US$ per Cwt	USDA ERS, Rice Yearbook Table 3
LRDSHA	MSG Rice Harvested Acres in Delta States	Million Acres	NASS
LRDSPA	LG Rice Planted Acres in Delta States	Million Acres	NASS
LRDSPA_LEAD1	LG Rice Planted Acres in Delta States (Led)	Million Acres	NASS
LRDSPAD1	Year Dummy (= 1 in 2000, 2004, and 2009, 0 otherwise)	Index	None
LRDSYLE	Expected LG Rice Yield in Delta States	Cwt per Acre	Calculated
LREX	LG Rice Exports	Million Cwt	USDA ERS, Rice Yearbook Table 3
LRMRRP	LG Rice-MSG Rice Price Ratio	Index	Calculated
LRUSRE	LG Rice Domestic and Residuals Use	Million Cwt	USDA ERS, Rice Yearbook Table 3
LRUSRFP	LG Rice Average Farm Price (Real)	US$ per Cwt	USDA ERS, Rice Yearbook Table 17
MRDSFP	MSG Rice Farm Price in Delta States	US$ per Cwt	USDA ERS, Rice Yearbook Table 4

Table A-1 (Continued)

Variable Name	Description	Units	Source
MRDSHA	LG Rice Harvested Acres in Delta States	Million Acres	NASS
MRDSPA	MSG Rice Planted Acres in Delta States	Million Acres	NASS
MRDSPA_LEAD1	MSG Rice Planted Acres in Delta States (Led)	Million Acres	NASS
MRDSPAD1	Year Dummy (= 1 in 2000, 2004, 2007, and 2011)	Index	None
MRDSPAD2	Year Dummy (= 1 in 1989, 1990, and 1993, 0 otherwise)	Index	None
MRDSYLE	Expected MSG Rice Yield in Delta States	Cwt per Acre	Calculated
MREX	MSG Rice Exports	Million Cwt	USDA ERS, Rice Yearbook Table 4
MRFWFP	MSG Rice Farm Price in Far West	US$ per Cwt	USDA ERS, Rice Yearbook Table 4
MRFWHA	MSG Rice Harvested Acres in Far West	Million Acres	NASS
MRFWPA	MSG Rice Planted Acres in Far West	Million Acres	NASS
MRFWPA_LEAD1	MSG Rice Planted Acres in Far West (Led)	Million Acres	NASS
MRFWPAD1	Year Dummy (= 1 in 1998, 1999, 2001, and 2003, 0 otherwise)	Index	None
MRFWPAD2	Year Dummy (= 1 in 1997, 2000, and 2004, 0 otherwise)	Index	None
MRFWYLE	Expected MSG Rice Yield in Far West	Cwt per Acre	Calculated
MRUSRE	MSG Rice Domestic and Residuals Use	Million Cwt	USDA ERS, Rice Yearbook Table 4
MRUSRFP	MSG Rice Average Farm Price (Real)	US$ per Cwt	USDA ERS, Rice Yearbook Table 17
MVBDMP	On-Highway Diesel Price (Nominal)	US$ per Gallon	EIA, Total Energy Table 9.4
MVUS	Estimated Number of Vehicles Using E85	Unit	EIA, Annual Energy Review, Table 10.5
NGIMP	Natural Gas Industrial Price	US$ per Thousand Ft^3	EIA
OACRFW	Oat-Corn ENRs Ratio in Far West	Index	Calculated
OAFWFP	Oats Farm Price in Far West	US$ per Bushel	NASS
OAFWHA	Oat harvested Acres in Far West	Million Acres	NASS
OAFWPA	Oat planted Acres in Far West	Million Acres	NASS
OAFWPA_LEAD1	Oat planted Acres in Far West (Led)	Million Acres	NASS
OAFWYLD1	Year Dummy (= 1 in 2001, 2003, and 2005, 0 otherwise)	Index	None
OAFWYLE	Expected Oats Yield in Far West	Bushels per Acre	Calculated
OALSFP	Oats Farm Price in Lake States	US$ per Bushel	NASS
OALSHA	Oat harvested Acres in Lake States	Million Acres	NASS
OALSPA	Oat planted Acres in Lake States	Million Acres	NASS
OALSPA_LEAD1	Oat planted Acres in Lake States (Led)	Million Acres	NASS

Table A-1 (Continued)

Variable Name	Description	Units	Source
OALSYLD1	Year Dummy (= 1 in 1988, 1991, and 1993, 0 otherwise)	Index	None
OALSYLE	Expected Oats Yield in Lake States	Bushels per Acre	Calculated
OANPFP	Oats Farm Price in Northern Plains	US$ per Bushel	NASS
OANPHA	Oat harvested Acres in Northern Plains	Million Acres	NASS
OANPPA	Oat planted Acres in Northern Plains	Million Acres	NASS
OANPPA_LEAD1	Oat planted Acres in Northern Plains (Led)	Million Acres	NASS
OANPYLE	Expected Oats Yield in Northern Plains	Bushels per Acre	Calculated
OASOSP	Oat-Sorghum ENRs Ratio in Southern Plains	Index	Calculated
OASPFP	Oats Farm Price in Southern Plains	US$ per Bushel	NASS
OASPHA	Oat harvested Acres in Southern Plains	Million Acres	NASS
OASPPA	Oat planted Acres in Southern Plains	Million Acres	NASS
OASPPA_LEAD1	Oat planted Acres in Southern Plains (Led)	Million Acres	NASS
OASPYLD1	Year Dummy (1989, 1994, 1996, 2006, and 2011 = 1, 0 otherwise)	Index	None
OASPYLE	Expected Oat Yield in Southern Plains	Bushels per Acre	Calculated
OAUSFE	Oat Feed and Residuals Use	Million Bushels	USDA ERS, Feed Grain Yearbook Table 7
OAUSFE_LAG1	Oat Feed and Residuals Use (Lagged)	Million Bushels	USDA ERS, Feed Grain Yearbook Table 7
OAUSPA_LEAD1	Oats Total Planted Acres (Led)	Million Acres	USDA ERS, Feed Grain Yearbook Table 1
OAUSPR	Oats Total Production	Million Bushels	USDA ERS, Feed Grain Yearbook Table 1
OAUSRFP	Oat Average Farm Price (Real)	US$ per Bushel	USDA ERS, Feed Grain Yearbook Table 14
OAUSSE	Oat Seed Use	Million Bushels	USDA ERS, Feed Grain Yearbook Table 7
OAWHRP	Oats-Wheat Price Ratio	Index	Calculated
PECRUMRR	Total Value of Peanut Products Per Pound (Real)	US$ per Bushel	Calculated
PEEX	Peanut Exports	Million Pounds	USDA ERS, Oil Crop Yearbook Table 11
PEEXD1	Year Dummy (= 1 in 1985, 1986, and 1989-1992, 0 otherwise)	Index	None
PESEHA	Peanut Harvested Acres in South East	Million Acres	NASS
PESEPA	Peanut Planted Acres in South East	Million Acres	NASS
PESEPA_LEAD1	Peanut Planted Acres in South East (Led)	Million Acres	NASS
PESEPAD1	Year Dummy (= 1 in 2004, 2007, and 2011, 0 otherwise)	Index	None
PESEYLD1	Year Dummy (= 1 in 1999, 2000, and 2002, 0 otherwise)	Index	None
PESEYLE	Expected Peanut Yield in South East	Pounds per Acre	Calculated

Table A-1 (Continued)

Variable Name	Description	Units	Source
PEUSCRU	Peanut Crush Demand	Million Pounds	USDA ERS, Oil Crop Yearbook Table 11
PEUSCRUD1	Year Dummy (= 1 in 1991, 1992, 1994, and 1995, 0 otherwise)	Index	None
PEUSCRUD2	Year Dummy (= 1 in 2001-02 and 2011-12, 0 otherwise)	Index	None
PEUSFA	Peanut Food Use	Million Pounds	USDA ERS, Oil Crop Yearbook Table 11
PEUSRFP	Peanut Average Farm Price (Real)	US$ per Pound	USDA ERS, Oil Crop Yearbook Table 11
PEUSSE	Peanut Seed, Loss, Shrinkage, and Residual Use	Million Pounds	USDA ERS, Oil Crop Yearbook Table 11
PEUSSED1	Year Dummy (= 1 in 1988, 1989, 1991, 1992, and 1995, 0 otherwise)	Index	None
POULTRY	Number of Poultry	Million	USDA ERS, Feed Grain Yearbook Table 30
RFCOMP	Refinery's Crude Acquisition Costs (Nominal)	US$ per Barrel	EIA, Total Refiner Acquisition Cost of Crude Oil
RFCORP	Refinery's Crude Acquisition Costs (Real)	US$ per Barrel	EIA, Total Refiner Acquisition Cost of Crude Oil
SBCBFP	Soybean Farm Price in Corn Belt	US$ per Bushel	NASS
SBCBHA	Soybean Harvested Acres in Corn Belt	Million Acres	NASS
SBCBPA	Soybean Planted Acres in Corn Belt	Million Acres	NASS
SBCBPA_LEAD1	Soybean Planted Acres in Corn Belt (Led)	Million Acres	NASS
SBCBYLE	Expected Soybean Yield in Expected Corn Belt	Bushels per Acre	Calculated
SBCOSE	Soybean-Cotton ENRs Ratio in South East	Index	Calculated
SBCPFP	Soybean Farm Price in Central Plains	US$ per Bushel	NASS
SBCPHA	Soybean Harvested Acres in Central Plains	Million Acres	NASS
SBCPPA	Soybean Planted Acres in Central Plains	Million Acres	NASS
SBCPPA_LEAD1	Soybean Planted Acres in Central Plains	Million Acres	NASS
SBCPYLE	Expected Soybean Yield in Central Plains	Bushels per Acre	Calculated
SBCRCB	Soybean-Corn ENRs Ratio in Corn Belt	Index	Calculated
SBCRCP	Soybean-Corn ENRs Ratio in Central Plains	Index	Calculated
SBCRDS	Soybean-Corn ENRs Ratio in Delta States	Index	Calculated
SBCRLS	Soybean-Corn ENRs Ratio in Lake States	Index	Calculated
SBCRNE	Soybean-Corn ENRs Ratio in North East	Index	Calculated
SBCRNP	Soybean-Corn ENRs Ratio in Northern Plains	Index	Calculated
SBCRUMRFP	SB Crushing Margins-Price Ratio	Index	Calculated
SBDSFP	Soybean Farm Price in Delta States	US$ per Bushel	NASS
SBDSHA	Soybean Harvested Acres in Delta States	Million Acres	NASS

Table A-1 (Continued)

Variable Name	Description	Units	Source
SBDSPA	Soybean Planted Acres in Delta States	Million Acres	NASS
SBDSPA_LEAD1	Soybean Planted Acres in Delta States (Led)	Million Acres	NASS
SBDSYLE	Expected Soybean Yield in Delta States	Bushels per Acre	Calculated
SBEX	Soybean Exports	Million Bushels	USDA ERS, Oil Crop Yearbook Table 3
SBEX_LAG1	Soybean Exports (Lagged)	Million Bushels	USDA ERS, Oil Crop Yearbook Table 3
SBEXD1	Year Dummy (= 1 in 1988, 1990, and 1993, 0 otherwise)	Index	None
SBLSFP	Soybean Farm Price in Lake States	US$ per Bushel	NASS
SBLSHA	Soybean Harvested Acres in Lake States	Million Acres	NASS
SBLSPA	Soybean Planted Acres in Lake States	Million Acres	NASS
SBLSPA_LEAD1	Soybean Planted Acres in Lake States (Led)	Million Acres	NASS
SBLSYLE	Expected Soybean Yield in Lake States	Bushels per Acre	Calculated
SBNEFP	Soybean Farm Price in North East	US$ per Bushel	NASS
SBNEHA	Soybean Harvested Acres in North East	Million Acres	NASS
SBNEPA	Soybean Planted Acres in North East	Million Acres	NASS
SBNEPA_LEAD1	Soybean Planted Acres in North East (Led)	Million Acres	NASS
SBNEYLD1	Year Dummy (= 1 in 1995, 1999, and 2002, 0 otherwise)	Index	None
SBNEYLE	Expected Soybean Yield in North East	Bushels per Acre	Calculated
SBNPFP	Soybean Farm Price in Northern Plains	US$ per Bushel	NASS
SBNPHA	Soybean Harvested Acres in Northern Plains	Million Acres	NASS
SBNPPA	Soybean Planted Acres in Northern Plains	Million Acres	NASS
SBNPPA_LEAD1	Soybean Planted Acres in Northern Plains (Led)	Million Acres	NASS
SBNPYLD1	Year Dummy (= 1 in 1994, 1998, and 1999, 0 otherwise)	Index	None
SBNPYLE	Expected Soybean Yield in Northern Plains	Bushels per Acre	Calculated
SBPESE	Soybean-Peanut ENRs Ratio in South East	Index	Calculated
SBSEFP	Soybean Farm Price in South East	US$ per Bushel	NASS
SBSEHA	Soybean Harvested Acres in South East	Million Acres	NASS
SBSEPA	Soybean Planted Acres in South East	Million Acres	NASS
SBSEPA_LEAD1	Soybean Planted Acres in South East (Led)	Million Acres	NASS
SBSEYLD1	Year Dummy (= 1 in 2003, 2004, and 2009, 0 otherwise)	Index	None
SBSEYLE	Expected Soybean Yield in South East	Bushels per Acre	Calculated

Table A-1 (Continued)

Variable Name	Description	Units	Source
SBUSCRU	Soybean Crush Demand	Million Bushels	USDA ERS, Oil Crop Yearbook Table 3
SBUSPA_LEAD1	Soybean Total Planted Acres (Led)	Million Acres	USDA ERS, Oil Crop Yearbook Table 2
SBUSRFP	Soybean Average Farm Price (Real)	US$ per Bushel	USDA ERS, Oil Crop Yearbook Table 9
SBUSRP	Soybean Price - Soybean Lagged Price Ratio	Index	Calculated
SBUSSE	Soybean Seed, Feed and Residual Use	Million Bushels	USDA ERS, Oil Crop Yearbook Table 3
SFUSPPI	Synthetic Fibers Producer Price Index (1985 = 100)	Index	National Cotton Council
SLCSRP	Soybean Oil-Cottonseed Oil Price Ratio	Index	Calculated
SLEX	Soybean Oil Exports	Million Pounds	USDA ERS, Oil Crop Yearbook Table 8
SLUSPR	Soybean Oil Total Production	Million Pounds	USDA ERS, Oil Crop Yearbook Table 5
SLUSRE	Soybean Oil Domestic Demand (Excluding Biodiesel Use)	Million Pounds	USDA ERS, Oil Crop Yearbook Table 5
SMUSPR	Soybean Meal Total Production	Million Short Tons	USDA ERS, Oil Crop Yearbook Table 4
SMUSRE	Soybean Meal Domestic Use	Million Short Tons	USDA ERS, Oil Crop Yearbook Table 4
SMUSRFP	Soybean Meal Average Farm Price (Real)	Thousand US$ per Ton	USDA ERS, Oil Crop Yearbook Table 4
SOCPFP	Sorghum Farm Price in Central Plains	US$ per Bushel	NASS
SOCPHA	Sorghum Harvested Acres in Central Plains	Million Acres	NASS
SOCPPA	Sorghum Planted Acres in Central Plains	Million Acres	NASS
SOCPPA_LEAD1	Sorghum Planted Acres in Central Plains (Led)	Million Acres	NASS
SOCPYLD1	Year Dummy (= 1 in 1989, 1991, 1993, and 1995, 0 otherwise)	Index	None
SOCPYLD2	Year Dummy (= 1 in 2002, 2003, 2006, 2011, and 2012)	Index	None
SOCPYLE	Expected Sorghum Yield in Central Plains	Bushels per Acre	Calculated
SOCRCP	Sorghum-Corn ENRs Ratio in Central Plains	Index	Calculated
SOCRRP	Sorghum Price Relative to Corn Price	Index	Calculated
SOEX	Sorghum Exports	Million Bushels	USDA ERS, Feed Grain Yearbook Table 5
SOSPFP	Sorghum Farm Price in Southern Plains	US$ per Bushel	NASS
SOSPHA	Sorghum Harvested Acres in Southern Plains	Million Acres	NASS
SOSPPA	Sorghum Planted Acres in Southern Plains	Million Acres	NASS
SOSPPA_LEAD1	Sorghum Planted Acres in Southern Plains (Led)	Million Acres	NASS
SOSPYLD1	Year Dummy (= 1 in 2004, 2007, 2010, and 2012)	Index	None
SOSPYLD2	Year Dummy (= 1 in 2001, 2006, 2008, 2009, and 2011)	Index	None
SOSPYLE	Expected Sorghum Yield in Southern Plains	Bushels per Acre	Calculated

Table A-1 (Continued)

Variable Name	Description	Units	Source
SOUSFA	Sorghum Food, Alcohol, and Industrial Use	Million Bushels	USDA ERS, Feed Grain Yearbook Table 5
SOUSFE	Sorghum Feed and Residuals Use	Million Bushels	USDA ERS, Feed Grain Yearbook Table 5
SOUSPA_LEAD1	Sorghum Total Planted Acres (Led)	Million Acres	USDA ERS, Feed Grain Yearbook Table 1
SOUSRFP	Sorghum Average Farm Price (Real)	US$ per Bushel	USDA ERS, Feed Grain Yearbook Table 13
SOUSSE	Sorghum Seed Use	Million Bushels	USDA ERS, Feed Grain Yearbook Table 5
THEXPRR	Thailand Milled Rice Prices, F.O.B. Bangkok (Real)	US$ per Cwt	USDA ERS, Rice Yearbook Table 20
USREER	Real Commodity Trade-Weighted Exchange Rates	Count	USDA ERS
WHBAFW	Wheat-Barley ENRs Ratio in Far West	Index	Calculated
WHCBFP	Wheat Farm Price in Corn Belt	US$ per Bushel	NASS
WHCBHA	Wheat Harvested Acres in Corn Belt	Million Acres	NASS
WHCBPA	Wheat Planted Acres in Corn Belt	Million Acres	NASS
WHCBPA_LEAD1	Wheat Planted Acres in Corn Belt (Led)	Million Acres	NASS
WHCBPAD1	Year Dummy (= 1 in 2008, 2009, and 2011)	Index	None
WHCBYLE	Expected Wheat Yield in Expected Corn Belt	Bushels per Acre	Calculated
WHCPFP	Wheat Farm Price in Central Plains	US$ per Bushel	NASS
WHCPHA	Wheat Harvested Acres in Central Plains	Million Acres	NASS
WHCPPA_LEAD1	Wheat Planted Acres in Central Plains	Million Acres	NASS
WHCPYLE	Expected Wheat Yield in Central Plains	Bushels per Acre	Calculated
WHCRDS	Wheat-Corn ENRs Ratio in Delta States	Index	Calculated
WHCRNP	Wheat-Corn ENRs Ratio in Northern Plains	Index	Calculated
WHCRRP	Wheat-Corn Price Ratio	Index	Calculated
WHCRSP	Wheat-Corn ENRs Ratio in Southern Plains	Index	Calculated
WHDSFP	Wheat Farm Price in Delta States	US$ per Bushel	NASS
WHDSHA	Wheat Harvested Acres in Delta States	Million Acres	NASS
WHDSPA	Wheat Planted Acres in Delta States	Million Acres	NASS
WHDSPA_LEAD1	Wheat Planted Acres in Delta States (Led)	Million Acres	NASS
WHDSPAD1	Year Dummy (= 1 in 2004, 2008, and 2009, 0 otherwise)	Index	None
WHDSYLD1	Year Dummy (= 1 in 1996, 1999, and 2000, 0 otherwise)	Index	None
WHDSYLE	Expected Wheat Yield in Delta States	Bushels per Acre	Calculated
WHEX	Wheat Exports	Million Bushels	USDA ERS, Wheat Yearbook Table 5

Table A-1 (Continued)

Variable Name	Description	Units	Source
WHEXD1	Year Dummy (= 1 in 1987-1988 and 1991-1992, 0 otherwise)	Index	None
WHFWFP	Wheat Farm Price in Far West	US$ per Bushel	NASS
WHFWHA	Wheat Harvested Acres in Far West	Million Acres	NASS
WHFWPA	Wheat Planted Acres in Far West	Million Acres	NASS
WHFWPA_LEAD1	Wheat Planted Acres in Far West (Led)	Million Acres	NASS
WHFWYLD1	Year Dummy (= 1 in 1987-1998 but 1989, 1991, and 1992, 0 otherwise)	Index	None
WHFWYLE	Expected Wheat Yield in Far West	Bushels per Acre	Calculated
WHLSFP	Wheat Farm Price in Lake States	US$ per Bushel	NASS
WHLSHA	Wheat Harvested Acres in Lake States	Million Acres	NASS
WHLSPA	Wheat Planted Acres in Lake States	Million Acres	NASS
WHLSPA_LEAD1	Wheat Planted Acres in Lake States (Led)	Million Acres	NASS
WHLSPAD1	Year Dummy (= 1 in 1987-1989, and 1991, 0 otherwise)	Index	None
WHLSYLD1	Year Dummy (= 1 in 1988, 1993, and 1994, 0 otherwise)	Index	None
WHLSYLE	Expected Wheat Yield in Lake States	Bushels per Acre	Calculated
WHNEHA	Wheat Harvested Acres in North East	Million Acres	NASS
WHNEPA_LEAD1	Wheat Planted Acres in North East (Led)	Million Acres	NASS
WHNEYLE	Expected Wheat Yield in North East	Bushels per Acre	Calculated
WHNPFP	Wheat Farm Price in Northern Plains	US$ per Bushel	NASS
WHNPHA	Wheat Harvested Acres in Northern Plains	Million Acres	NASS
WHNPPA	Wheat Planted Acres in Northern Plains	Million Acres	NASS
WHNPPA_LEAD1	Wheat Planted Acres in Northern Plains (Led)	Million Acres	NASS
WHNPPAD1	Year Dummy (= 1 in 1988, 1991, and 1995, 0 otherwise)	Index	None
WHNPYLE	Expected Wheat Yield in Northern Plains	Bushels per Acre	Calculated
WHPESE	Wheat-Peanut ENRs Ratio in South East	Index	Calculated
WHSBCB	Wheat-Soybean ENRs Ratio in Corn Belt	Index	Calculated
WHSBLS	Wheat-Soybean ENRs Ratio in Lake States	Index	Calculated
WHSEFP	Wheat Farm Price in South East	US$ per Bushel	NASS
WHSEHA	Wheat Harvested Acres in South East	Million Acres	NASS
WHSEPA	Wheat Planted Acres in South East	Million Acres	NASS
WHSEPA_LEAD1	Wheat Planted Acres in South East (Led)	Million Acres	NASS

Table A-1 (Continued)

Variable Name	Description	Units	Source
WHSPYLD1	Year Dummy (= 1 in 2006, 2009, and 2011, 0 otherwise)	Index	None
WHSPYLE	Expected Wheat Yield in Southern Plains	Bushels per Acre	Calculated
WHUSFA	Wheat Food Use	Million Bushels	USDA ERS, Wheat Yearbook Table 5
WHUSFA_LAG1	Wheat Food Use (Lagged)	Million Bushels	USDA ERS, Wheat Yearbook Table 5
WHUSPA_LEAD1	Wheat Total Planted Acres (Led)	Million Acres	USDA ERS, Wheat Yearbook Table 1
WHUSRE	Wheat Feed and Residuals Use	Million Bushels	USDA ERS, Wheat Yearbook Table 5
WHUSRFP	Wheat Average Farm Price (Real)	US$ per Bushel	USDA ERS, Wheat Yearbook Table 18
WHUSRP	Wheat-Lagged Wheat Price Ratio	Index	Calculated
WHUSSE	Wheat Seed Use	Million Bushels	USDA ERS, Wheat Yearbook Table 5
WMOPMRN	Wet Milling Operation Margin (Nominal)	US$ per Bushel	Calculated

Table A-2. Summary Statistics

Year	BACRNP	BACRRP	BAEXD1	BAFWFP	BAFWHA	BAFWPA	BAFWPA _LEAD1	BAFWYLE	BANPHA	BANPPA	BANPPA _LEAD1
1985	1.115	1.126	0.000	2.211	3.431	3.602	3.120	61.782	5.730	6.800	7.085
1986	-0.152	0.932	0.000	1.918	2.972	3.120	2.313	62.569	6.630	7.085	6.310
1987	0.918	1.072	0.000	2.068	2.173	2.313	2.213	63.356	5.980	6.310	5.430
1988	1.090	0.907	0.000	2.631	2.040	2.213	2.051	64.143	3.965	5.430	5.260
1989	0.976	0.975	0.000	2.544	1.907	2.051	1.779	64.931	4.900	5.260	4.880
1990	1.104	1.065	0.000	2.475	1.659	1.779	1.945	65.718	4.455	4.880	5.340
1991	1.328	1.129	0.000	2.513	1.814	1.945	1.746	66.505	5.075	5.340	4.600
1992	0.496	1.015	0.000	2.543	1.641	1.746	1.673	67.292	4.355	4.600	4.720
1993	0.578	1.256	0.000	2.435	1.573	1.673	1.644	72.943	3.970	4.720	4.250
1994	2.228	1.113	0.000	2.381	1.525	1.644	1.583	73.731	4.010	4.250	3.880
1995	1.058	1.121	0.000	3.032	1.470	1.583	1.788	74.518	3.705	3.880	4.185
1996	1.258	0.989	1.000	3.039	1.676	1.788	1.798	70.441	4.015	4.185	3.895
1997	1.290	1.021	0.000	2.606	1.670	1.798	1.795	71.228	3.625	3.895	3.570
1998	1.700	0.980	1.000	2.096	1.687	1.795	1.658	72.015	3.310	3.570	2.620
1999	0.391	0.854	1.000	2.265	1.569	1.658	1.674	72.803	2.399	2.620	3.320
2000	0.643	0.877	0.000	2.300	1.575	1.674	1.537	73.590	2.920	3.320	2.790
2001	1.557	0.887	0.000	2.462	1.411	1.537	1.412	65.063	2.333	2.790	2.945
2002	2.544	0.853	0.000	2.848	1.273	1.412	1.326	65.850	2.340	2.945	3.365
2003	1.647	0.855	0.000	2.959	1.220	1.326	1.214	66.637	2.960	3.365	2.760
2004	1.352	0.831	0.000	2.727	1.120	1.214	1.093	76.739	2.435	2.760	2.240
2005	1.500	0.791	0.000	2.795	0.970	1.093	0.949	77.526	1.867	2.240	1.995
2006	2.437	1.067	0.000	3.035	0.865	0.949	1.031	78.313	1.686	1.995	2.488
2007	2.502	1.045	0.000	4.300	0.926	1.031	1.046	79.100	2.192	2.488	2.663
2008	1.181	0.756	0.000	5.347	0.948	1.046	0.858	79.887	2.398	2.663	2.208
2009	1.159	0.762	0.000	4.613	0.773	0.858	0.823	86.975	1.936	2.208	1.590
2010	3.839	1.342	0.000	3.993	0.741	0.823	0.888	87.762	1.363	1.590	1.200
2011	3.024	1.159	0.000	5.522	0.813	0.888	1.067	88.550	1.049	1.200	2.069
2012	1.922	1.086	0.000	6.268	0.971	1.067	1.079	83.036	1.882	2.069	1.880

Table A-2 (Continued)

Year	BANPYLE	BASORP	BAUSPR	BAUSRFP	BAUSSE	BAWHFW	BD100RP	BDEXN	BDEXN _LAG1	BDOPMRR	BDSLPR
1985	44.572	0.975	590.213	3.642	21.300	1.733	0.000	0.000	0.000	0.000	0.000
1986	45.117	0.851	608.532	2.897	17.900	1.435	0.000	0.000	0.000	0.000	0.000
1987	45.662	0.939	521.499	3.165	15.700	1.634	0.000	0.000	0.000	0.000	0.000
1988	22.676	0.811	289.994	4.734	15.000	1.854	0.000	0.000	0.000	0.000	0.000
1989	46.752	0.868	404.203	3.943	13.500	1.624	0.000	0.000	0.000	0.000	0.000
1990	47.296	0.991	422.196	3.357	14.600	1.224	0.000	0.000	0.000	0.000	0.000
1991	47.841	1.071	464.326	3.182	12.800	1.484	0.000	0.000	0.000	0.000	0.000
1992	58.711	0.926	455.090	3.019	12.900	1.533	0.000	0.000	0.000	0.000	0.000
1993	48.931	1.161	398.041	2.881	11.900	1.385	0.000	0.000	0.000	0.000	0.000
1994	49.476	1.049	374.862	2.879	11.100	1.797	0.000	0.000	0.000	0.000	0.000
1995	50.020	1.104	359.376	4.015	11.716	1.655	0.000	0.000	0.000	0.000	0.000
1996	50.565	0.854	392.433	3.735	11.074	1.643	0.000	0.000	0.000	0.000	0.000
1997	51.110	0.929	359.878	3.188	10.409	1.559	0.000	0.000	0.000	0.000	0.000
1998	51.655	0.838	351.569	2.623	8.488	1.751	0.000	0.000	0.000	0.000	0.000
1999	52.200	0.737	271.996	2.780	9.639	1.365	0.000	0.000	0.000	0.000	0.000
2000	52.744	0.896	317.804	2.696	8.201	1.263	0.000	0.000	0.000	0.000	0.000
2001	53.289	0.874	248.329	2.774	8.212	1.685	3.611	-1,636.320	0.000	2.015	5,574.715
2002	44.363	0.853	226.906	3.344	8.737	1.535	3.424	-5,684.448	-1,636.320	1.323	6,814.626
2003	54.379	0.845	278.283	3.408	7.437	1.484	3.523	676.956	-5,684.448	0.709	9,236.191
2004	54.924	0.722	279.743	2.905	6.401	1.365	3.599	1,104.054	676.956	1.456	18,188.270
2005	55.468	0.735	211.896	2.868	5.720	1.196	3.821	-39.900	1,104.054	2.819	59,011.298
2006	56.013	1.154	180.165	3.130	6.569	1.503	3.803	-10,144.470	-39.900	2.149	162,785.505
2007	56.558	1.015	210.110	4.290	7.001	1.698	3.518	131,668.656	-10,144.470	0.196	318,386.223
2008	57.103	0.596	240.193	5.606	5.880	1.148	4.244	362,310.312	131,668.656	2.519	440,768.956
2009	57.648	0.691	227.323	4.823	4.995	0.899	3.741	188,519.982	362,310.312	1.818	335,264.857
2010	58.192	1.301	180.268	3.942	4.790	1.447	3.600	82,230.330	188,519.982	0.325	223,239.307
2011	58.737	1.140	155.780	5.350	6.272	1.269	4.095	36,899.688	82,230.330	0.961	628,862.844
2012	59.282	1.078	220.284	6.400	6.300	1.270	4.390	88,430.412	36,899.688	1.386	629,850.000

Table A-2 (Continued)

Year	BDUSDE	CLUSMP	COCRDS	CODSFP	CODSHA	CODSPA	CODSPA _LEAD1	CODSPAD1	CODSYLD1	CODSYLE	COFWFP
1985	0.000	0.185	0.669	0.559	2.110	2.155	2.090	0.000	0.000	684.298	0.610
1986	0.000	0.214	0.316	0.503	2.050	2.090	2.180	0.000	0.000	693.812	0.580
1987	0.000	0.233	0.345	0.635	2.160	2.180	2.660	0.000	0.000	703.325	0.687
1988	0.000	0.210	1.084	0.541	2.510	2.660	2.305	0.000	0.000	712.838	0.629
1989	0.000	0.248	0.583	0.632	2.235	2.305	2.810	0.000	0.000	722.352	0.706
1990	0.000	0.275	0.591	0.657	2.760	2.810	3.120	0.000	0.000	731.865	0.751
1991	0.000	0.258	0.876	0.552	3.030	3.120	3.240	0.000	0.000	741.379	0.650
1992	0.000	0.209	0.698	0.536	3.195	3.240	3.210	0.000	0.000	750.892	0.590
1993	0.000	0.272	1.869	0.575	3.145	3.210	3.160	0.000	0.000	588.335	0.641
1994	0.000	0.265	0.412	0.695	3.130	3.160	3.715	0.000	0.000	769.919	0.781
1995	0.000	0.252	1.149	0.733	3.605	3.715	3.010	0.000	0.000	607.362	0.798
1996	0.000	0.241	0.832	0.683	2.975	3.010	2.620	0.000	0.000	788.946	0.748
1997	0.000	0.289	0.624	0.652	2.585	2.620	2.405	0.000	0.000	798.459	0.708
1998	0.000	0.253	0.054	0.609	2.365	2.405	2.785	0.000	0.000	807.972	0.633
1999	0.000	0.178	0.672	0.457	2.750	2.785	2.970	0.000	0.000	817.486	0.524
2000	0.000	0.135	1.142	0.523	2.925	2.970	3.570	0.000	0.000	671.283	0.488
2001	10,212.804	0.191	-2.760	0.273	3.520	3.570	2.650	1.000	0.000	836.513	0.379
2002	16,168.488	0.282	1.262	0.442	2.565	2.650	2.615	0.000	0.000	846.026	0.540
2003	13,532.568	0.284	0.644	0.613	2.545	2.615	2.520	0.000	0.000	855.539	0.723
2004	26,877.900	0.279	0.933	0.411	2.490	2.520	2.870	0.000	1.000	985.853	0.495
2005	90,826.512	0.252	1.150	0.466	2.840	2.870	3.035	0.000	0.000	874.566	0.572
2006	260,583.708	0.318	1.780	0.459	3.010	3.035	1.855	1.000	0.000	884.080	0.547
2007	358,156.302	0.694	2.207	0.576	1.835	1.855	1.285	1.000	1.000	1,014.394	0.666
2008	315,795.774	0.328	8.442	0.485	1.209	1.285	1.055	0.000	0.000	903.106	0.589
2009	325,508.106	0.393	3.388	0.636	1.015	1.055	1.220	0.000	0.000	756.903	0.676
2010	262,852.758	0.608	1.506	0.768	1.199	1.220	1.605	0.000	0.000	922.133	0.930
2011	887,123.370	0.555	1.310	0.948	1.555	1.605	1.290	1.000	0.000	931.647	0.987
2012	869,910.000	0.540	3.505	0.695	1.260	1.290	0.770	0.000	1.000	1,061.961	0.808

Table A-2 (Continued)

Year	COFWHA	COFWPA	COFWPA _LEAD1	COFWYLD1	COFWYLE	COPESE	COSBDS	COSEFP	COSEHA	COSEPA	COSEPA _LEAD1
1985	1.679	1.690	1.250	0.000	1,114.414	2.313	0.391	0.544	1.142	1.163	1.101
1986	1.239	1.250	1.440	0.000	1,128.236	6.162	0.432	0.517	1.057	1.101	1.272
1987	1.429	1.440	1.700	0.000	1,289.105	4.514	0.436	0.629	1.258	1.272	1.582
1988	1.684	1.700	1.290	0.000	1,155.882	8.220	0.954	0.540	1.518	1.582	1.318
1989	1.279	1.290	1.450	0.000	1,169.705	3.936	0.370	0.639	1.298	1.318	1.658
1990	1.438	1.450	1.340	0.000	1,183.528	2.513	0.377	0.681	1.638	1.658	2.199
1991	1.336	1.340	1.325	0.000	1,197.350	4.914	0.521	0.578	2.176	2.199	2.149
1992	1.318	1.325	1.366	0.000	1,211.173	6.572	0.801	0.554	2.119	2.149	2.352
1993	1.360	1.366	1.413	0.000	1,224.996	25.287	1.575	0.586	2.304	2.352	2.760
1994	1.407	1.413	1.535	0.000	1,238.819	1.642	0.312	0.717	2.733	2.760	4.160
1995	1.529	1.535	1.315	0.000	951.544	5.842	0.794	0.765	4.085	4.160	3.626
1996	1.309	1.315	1.205	0.000	1,266.464	2.872	0.560	0.706	3.594	3.626	3.646
1997	1.199	1.205	0.900	0.000	1,280.287	3.513	0.575	0.671	3.517	3.646	3.496
1998	0.868	0.900	0.880	0.000	993.012	3.163	0.221	0.627	3.362	3.496	4.032
1999	0.874	0.880	1.055	0.000	1,307.933	-16.243	0.701	0.459	3.780	4.032	4.130
2000	1.048	1.055	0.925	0.000	1,321.756	5.717	0.879	0.533	3.874	4.130	4.220
2001	0.915	0.925	0.695	0.000	1,335.578	-6.116	-2.099	0.305	4.189	4.220	4.055
2002	0.690	0.695	0.765	0.000	1,349.401	21.246	0.897	0.438	3.753	4.055	3.598
2003	0.758	0.765	0.800	0.000	1,363.224	1.597	0.684	0.612	3.495	3.598	3.486
2004	0.795	0.800	0.660	1.000	1,509.889	4.930	0.808	0.422	3.452	3.486	3.670
2005	0.657	0.660	0.475	0.000	1,390.870	4.304	1.141	0.477	3.642	3.670	4.053
2006	0.471	0.475	0.365	0.000	1,404.692	4.998	1.349	0.463	3.993	4.053	2.770
2007	0.362	0.365	0.255	1.000	1,551.357	7.647	1.259	0.580	2.678	2.770	2.208
2008	0.250	0.255	0.216	0.000	1,432.338	11.138	5.764	0.490	2.173	2.208	2.191
2009	0.214	0.216	0.319	0.000	1,446.161	1.503	3.408	0.660	2.143	2.191	2.987
2010	0.316	0.319	0.432	0.000	1,459.984	1.195	1.109	0.845	2.957	2.987	3.901
2011	0.429	0.432	0.342	0.000	1,473.806	1.563	0.766	0.942	3.762	3.901	3.127
2012	0.339	0.342	0.290	1.000	1,620.471	3.828	1.959	0.791	3.103	3.127	2.785

Table A-2 (Continued)

Year	COSEYLD1	COSEYLE	COSPFP	COSPHA	COSPHAD1	COSPHAD2	COSPPA	COSPPA _LEAD1	COSPPAD1	COSPPAD2	COSPYLE
1985	0.000	706.022	0.515	5.064	0.000	0.000	5.440	5.313	0.000	1.000	408.879
1986	0.000	555.551	0.461	3.850	0.000	0.000	5.313	5.166	0.000	1.000	413.991
1987	0.000	565.355	0.596	4.847	0.000	0.000	5.166	6.137	0.000	0.000	419.104
1988	0.000	575.158	0.515	5.804	0.000	0.000	6.137	5.081	0.000	1.000	424.216
1989	0.000	584.962	0.592	4.145	0.000	0.000	5.081	5.949	0.000	0.000	429.328
1990	0.000	594.766	0.633	5.432	0.000	0.000	5.949	6.809	0.000	0.000	434.440
1991	0.000	604.569	0.534	5.845	0.000	0.000	6.809	5.925	0.000	0.000	439.553
1992	0.000	614.373	0.491	3.902	0.000	1.000	5.925	5.973	0.000	0.000	444.665
1993	1.000	484.730	0.534	5.449	0.000	0.000	5.973	5.865	0.000	0.000	449.777
1994	0.000	794.254	0.696	5.540	0.000	0.000	5.865	6.841	0.000	0.000	454.890
1995	1.000	504.337	0.747	6.121	0.000	0.000	6.841	6.049	0.000	0.000	460.002
1996	0.000	653.587	0.656	4.365	0.000	1.000	6.049	5.770	0.000	0.000	465.114
1997	0.000	663.391	0.600	5.456	0.000	0.000	5.770	5.876	0.000	0.000	470.227
1998	0.000	673.194	0.562	3.480	0.000	1.000	5.876	6.474	0.000	0.000	475.339
1999	1.000	543.551	0.410	5.329	0.000	0.000	6.474	6.752	0.000	0.000	480.451
2000	0.000	692.802	0.460	4.612	0.000	1.000	6.752	6.338	0.000	0.000	485.563
2001	0.000	702.605	0.286	4.500	0.000	0.000	6.338	5.854	0.000	0.000	490.676
2002	1.000	572.962	0.403	4.730	0.000	0.000	5.854	5.833	0.000	0.000	495.788
2003	0.000	722.212	0.578	4.558	0.000	0.000	5.833	6.138	0.000	0.000	500.900
2004	0.000	732.016	0.403	5.614	0.000	0.000	6.138	6.261	0.000	0.000	728.060
2005	0.000	741.820	0.465	5.891	0.000	0.000	6.261	6.770	0.000	0.000	733.173
2006	0.000	751.623	0.464	4.328	1.000	0.000	6.770	5.118	1.000	0.000	738.285
2007	0.000	761.427	0.604	4.904	0.000	0.000	5.118	5.208	1.000	0.000	743.397
2008	0.000	856.436	0.438	3.440	1.000	0.000	5.208	5.236	1.000	0.000	633.405
2009	0.000	866.239	0.602	3.724	1.000	0.000	5.236	5.883	0.000	0.000	638.517
2010	0.000	790.838	0.813	5.667	0.000	0.000	5.883	8.035	0.000	0.000	643.630
2011	0.000	800.641	0.894	2.978	1.000	0.000	8.035	6.955	0.000	0.000	648.742
2012	0.000	895.650	0.572	5.122	0.000	0.000	6.955	5.880	1.000	0.000	653.854

Table A-2 (Continued)

Year	COUSMI	COUSRFP	CRBAFW	CRCBFP	CRCBHA	CRCBPA	CRCBPA _LEAD1	CRCBYLD1	CRCBYLE	CRCOSP	CRCPFP
1985	3,078.240	1.045	0.271	2.156	37.580	38.650	35.200	0.000	119.245	-0.214	2.252
1986	3,576.960	0.927	0.374	1.481	34.290	35.200	30.300	0.000	121.072	-0.197	1.539
1987	3,656.160	1.114	0.341	1.947	29.480	30.300	31.900	0.000	122.899	-0.054	1.942
1988	3,735.360	0.940	0.326	2.553	30.320	31.900	34.500	1.000	96.085	-0.214	2.503
1989	4,204.320	1.036	0.327	2.379	33.470	34.500	34.800	0.000	126.553	-0.039	2.300
1990	4,155.360	1.053	0.325	2.293	33.660	34.800	35.400	0.000	128.380	0.025	2.284
1991	4,614.240	0.861	0.331	2.397	34.350	35.400	36.800	1.000	101.566	-0.199	2.361
1992	4,920.000	0.795	0.359	2.062	35.920	36.800	33.750	0.000	145.628	-0.317	2.113
1993	5,000.640	0.841	0.303	2.525	31.530	33.750	36.700	1.000	105.220	-0.198	2.550
1994	5,375.040	1.021	0.336	2.244	35.810	36.700	32.450	0.000	149.282	0.285	2.332
1995	5,110.560	1.047	0.322	3.284	31.470	32.450	34.950	1.000	108.874	0.215	3.233
1996	5,340.480	0.945	0.344	2.712	33.990	34.950	35.800	0.000	139.342	0.033	2.690
1997	5,447.520	0.873	0.306	2.447	34.850	35.800	35.100	0.000	141.169	-0.112	2.377
1998	4,992.480	0.797	0.267	1.976	34.040	35.100	34.800	0.000	142.997	0.023	1.905
1999	4,893.120	0.587	0.337	1.834	33.870	34.800	35.600	0.000	144.824	-0.539	1.773
2000	4,253.760	0.636	0.332	1.843	34.670	35.600	34.600	0.000	146.651	-0.817	1.943
2001	3,694.080	0.372	0.260	1.974	33.690	34.600	34.750	0.000	148.478	-1.388	1.978
2002	3,491.040	0.547	0.312	2.317	33.640	34.750	35.300	0.000	150.305	-0.201	2.373
2003	3,007.680	0.744	0.326	2.424	34.210	35.300	36.450	0.000	152.132	0.066	2.421
2004	3,211.680	0.487	0.391	2.047	35.520	36.450	37.350	0.000	153.959	0.237	2.058
2005	2,818.080	0.541	0.396	2.001	36.440	37.350	35.250	0.000	155.786	0.309	1.980
2006	2,368.800	0.511	0.313	3.071	34.470	35.250	41.200	0.000	157.613	0.174	3.018
2007	2,200.320	0.633	0.366	4.228	40.200	41.200	37.200	0.000	159.440	0.145	4.125
2008	1,699.680	0.499	0.481	4.076	35.930	37.200	37.550	0.000	161.267	-0.332	4.073
2009	1,704.000	0.651	0.491	3.577	36.620	37.550	38.500	0.000	163.094	-0.101	3.563
2010	1,872.000	0.832	0.282	5.284	37.440	38.500	39.300	0.000	164.921	0.289	5.045
2011	1,584.000	0.883	0.370	6.248	38.140	39.300	41.489	0.000	166.749	0.442	6.150
2012	1,632.000	0.710	0.823	7.326	39.120	40.700	39.700	0.000	113.359	-0.200	7.054

Table A-2 (Continued)

Year	CRCPHA	CRCPPA _LEAD1	CRCPYLE	CRDSFP	CRDSHA	CRDSPA	CRDSPA _LEAD1	CRDSYLE	CREX	CREXD1	CRFWFP
1985	9.365	9.570	127.956	2.620	0.393	0.460	0.700	87.898	1,227.332	0.000	2.837
1986	9.045	8.650	128.905	1.795	0.635	0.700	0.505	90.023	1,492.471	0.000	2.018
1987	8.120	9.060	129.855	1.986	0.426	0.505	0.410	92.147	1,716.425	0.000	2.317
1988	8.550	9.820	130.805	2.791	0.335	0.410	0.402	94.272	2,028.453	0.000	3.106
1989	9.170	10.250	131.755	2.574	0.340	0.402	0.470	96.396	2,367.303	0.000	2.937
1990	9.580	10.995	132.704	2.618	0.399	0.470	0.555	98.521	1,726.631	0.000	2.903
1991	10.320	11.140	133.654	2.612	0.477	0.555	0.780	100.646	1,583.917	0.000	2.919
1992	10.510	11.005	134.604	2.302	0.704	0.780	0.550	102.770	1,663.278	0.000	2.721
1993	10.240	11.850	109.875	2.512	0.490	0.550	0.710	104.895	1,328.322	1.000	3.155
1994	11.190	11.100	136.503	2.368	0.661	0.710	0.625	107.019	2,177.482	0.000	2.875
1995	10.500	12.000	111.774	2.997	0.581	0.625	1.405	109.144	2,227.824	0.000	3.819
1996	11.490	12.740	138.402	3.264	1.348	1.405	1.080	111.269	1,797.369	0.000	3.326
1997	12.180	12.980	139.352	2.643	1.035	1.080	1.485	113.393	1,504.426	1.000	3.048
1998	12.470	12.980	140.302	2.006	1.255	1.485	0.785	86.288	1,984.193	0.000	2.581
1999	12.400	13.300	141.251	1.984	0.740	0.785	0.950	117.642	1,936.566	0.000	2.440
2000	12.370	12.770	125.846	1.807	0.910	0.950	0.905	119.767	1,941.348	0.000	2.517
2001	11.870	12.850	143.151	2.075	0.877	0.905	1.395	121.892	1,904.768	0.000	2.550
2002	10.670	12.080	127.745	2.379	1.325	1.395	1.435	124.016	1,587.887	1.000	2.842
2003	11.090	12.550	145.050	2.347	1.380	1.435	1.200	126.141	1,899.817	0.000	2.980
2004	11.870	13.250	146.000	2.426	1.155	1.200	0.960	128.265	1,818.056	0.000	2.805
2005	12.650	12.450	146.949	2.214	0.925	0.960	0.830	130.390	2,133.812	0.000	2.757
2006	11.610	14.500	147.899	2.796	0.795	0.830	2.280	132.515	2,125.369	0.000	3.604
2007	13.940	13.900	148.849	3.754	2.230	2.280	1.680	158.507	2,437.402	0.000	4.508
2008	13.190	14.350	149.798	4.516	1.640	1.680	1.790	136.764	1,848.947	0.000	4.605
2009	13.700	15.330	166.915	3.679	1.715	1.790	1.650	138.888	1,980.023	0.000	4.348
2010	14.710	16.250	151.698	4.587	1.550	1.650	1.950	141.013	1,834.167	0.000	5.513
2011	15.100	16.087	152.647	6.169	1.830	1.950	1.930	143.138	1,540.000	0.000	6.255
2012	14.320	15.950	169.764	7.200	2.000	2.070	2.700	166.996	700.000	0.000	7.110

Table A-2 (Continued)

Year	CRFWHA	CRFWPA	CRFWPA _LEAD1	CRFWYLE	CRLSFP	CRLSHA	CRLSPA	CRLSPA _LEAD1	CRLSYLE	CRNEFP	CRNEHA
1985	0.605	1.086	0.957	150.416	2.105	12.380	14.700	13.000	109.578	2.449	3.097
1986	0.493	0.957	0.801	151.812	1.454	11.150	13.000	11.250	111.430	1.795	2.793
1987	0.410	0.801	0.744	153.209	1.987	9.580	11.250	11.250	113.282	2.302	2.433
1988	0.371	0.744	0.775	154.606	2.458	8.250	11.250	12.100	71.672	2.984	2.129
1989	0.380	0.775	0.725	156.003	2.282	10.370	12.100	12.800	116.985	2.794	2.180
1990	0.314	0.725	0.712	157.400	2.180	11.220	12.800	13.000	118.837	2.517	2.337
1991	0.307	0.712	0.719	158.797	2.265	11.500	13.000	13.800	120.689	2.761	2.194
1992	0.321	0.719	0.774	160.194	1.967	11.750	13.800	12.100	122.541	2.333	2.303
1993	0.346	0.774	0.813	161.591	2.376	9.000	12.100	13.250	84.953	2.888	2.213
1994	0.377	0.813	0.822	162.988	2.235	11.730	13.250	12.800	126.244	2.599	2.256
1995	0.350	0.822	0.962	164.385	3.143	11.370	12.800	14.000	128.096	3.807	2.262
1996	0.477	0.962	1.032	165.781	2.534	12.200	14.000	13.350	129.948	3.011	2.453
1997	0.490	1.032	1.072	167.178	2.243	11.680	13.350	13.300	131.800	2.839	2.310
1998	0.484	1.072	1.001	168.575	1.768	11.750	13.300	12.900	133.651	2.365	2.317
1999	0.420	1.001	1.069	169.972	1.670	11.400	12.900	12.900	135.503	2.333	2.064
2000	0.440	1.069	0.933	171.369	1.774	11.350	12.900	12.400	137.355	2.101	2.200
2001	0.321	0.933	1.034	172.766	1.928	10.700	12.400	13.100	139.207	2.312	2.164
2002	0.329	1.034	1.007	174.163	2.193	11.600	13.100	13.200	141.059	2.898	1.992
2003	0.325	1.007	1.110	175.560	2.353	11.530	13.200	13.300	142.910	2.885	1.990
2004	0.397	1.110	1.108	176.957	1.987	11.570	13.300	13.350	144.762	2.250	2.159
2005	0.329	1.108	1.100	178.354	1.881	11.760	13.350	13.150	162.387	2.264	2.064
2006	0.314	1.100	1.355	179.750	2.957	11.600	13.150	15.100	148.466	3.486	2.116
2007	0.489	1.355	1.320	188.402	4.162	13.470	15.100	13.900	150.318	4.719	2.289
2008	0.411	1.320	1.199	189.799	3.901	12.220	13.900	13.800	152.169	4.284	2.172
2009	0.414	1.199	1.319	191.196	3.502	12.170	13.800	14.000	154.021	3.851	2.203
2010	0.498	1.319	1.406	192.593	5.154	12.500	14.000	14.750	155.873	6.166	2.203
2011	0.508	1.406	1.434	193.989	5.920	13.210	14.750	14.616	157.725	6.813	2.304
2012	0.538	1.403	1.423	108.395	6.967	14.040	15.700	15.700	159.577	8.198	2.370

Table A-2 (Continued)

Year	CRNEPA	CRNEPA _LEAD1	CRNEYLE	CRNPFP	CRNPHA	CRNPPA	CRNPPA _LEAD1	CRNPYLD1	CRNPYLE	CROALS	CROANP
1985	4.627	4.290	95.872	2.092	3.624	4.678	4.350	0.000	73.407	0.396	0.569
1986	4.290	3.861	97.135	1.389	3.394	4.350	3.980	0.000	75.644	0.571	-7.880
1987	3.861	3.633	98.397	1.923	3.206	3.980	4.125	0.000	77.881	0.483	1.343
1988	3.633	3.560	70.403	2.408	2.853	4.125	4.450	1.000	57.109	1.253	2.073
1989	3.560	3.731	100.921	2.162	3.160	4.450	4.405	0.000	82.354	0.266	-0.146
1990	3.731	3.728	102.183	2.098	3.519	4.405	4.835	0.000	84.590	0.133	0.118
1991	3.728	3.672	103.445	2.174	3.884	4.835	4.960	0.000	86.827	0.047	0.265
1992	3.672	3.542	104.707	1.854	3.958	4.960	4.290	0.000	89.063	0.303	1.158
1993	3.542	3.515	105.969	2.285	2.979	4.290	4.710	1.000	68.291	0.256	2.097
1994	3.515	3.474	107.231	2.026	3.935	4.710	3.635	0.000	108.438	0.173	0.163
1995	3.474	3.682	108.494	3.230	3.024	3.635	4.890	1.000	72.764	0.106	0.564
1996	3.682	3.805	109.756	2.335	4.315	4.890	4.725	0.000	98.009	0.391	0.732
1997	3.805	3.723	111.018	2.153	4.056	4.725	5.025	0.000	100.245	0.283	0.520
1998	3.723	3.680	112.280	1.634	4.453	5.025	4.550	0.000	117.383	0.209	0.212
1999	3.680	3.517	78.510	1.554	3.975	4.550	5.530	0.000	104.718	0.224	0.950
2000	3.517	3.459	131.520	1.623	4.804	5.530	4.835	0.000	106.955	0.281	0.707
2001	3.459	3.445	116.066	1.779	4.169	4.835	5.825	0.000	109.191	0.368	1.331
2002	3.445	3.423	82.296	2.173	4.293	5.825	6.003	0.000	111.428	0.288	0.264
2003	3.423	3.354	118.590	2.305	5.087	6.003	6.610	0.000	113.664	0.241	0.243
2004	3.354	3.281	136.568	1.839	5.365	6.610	6.005	0.000	115.901	0.234	0.330
2005	3.281	3.257	121.114	1.803	5.216	6.005	6.340	0.000	118.137	0.165	0.336
2006	3.257	3.548	122.377	2.847	4.683	6.340	7.689	0.000	120.374	0.082	-0.012
2007	3.548	3.374	123.639	4.128	6.928	7.689	7.473	0.000	122.610	0.186	0.278
2008	3.374	3.366	124.901	3.771	6.787	7.473	7.112	0.000	124.847	0.200	0.293
2009	3.366	3.388	126.163	3.229	6.491	7.112	6.770	0.000	127.083	0.066	0.192
2010	3.388	3.528	127.425	5.073	6.184	6.770	7.612	0.000	129.320	0.101	0.189
2011	3.528	3.445	128.687	5.978	7.116	7.612	8.063	0.000	131.556	0.153	0.198
2012	3.623	3.736	129.949	7.588	8.873	9.960	10.030	0.000	100.678	0.150	0.241

Table A-2 (Continued)

Year	CRSBCB	CRSBCP	CRSBDS	CRSBLS	CRSBNE	CRSBNP	CRSBSE	CRSEFP	CRSEHA	CRSEPA	CRSEPA _LEAD1
1985	0.980	0.561	0.584	1.105	0.880	3.184	0.953	2.363	6.555	7.500	6.960
1986	1.749	1.000	1.369	2.090	1.641	-26.616	1.950	1.752	5.670	6.960	5.395
1987	1.434	0.936	1.263	1.537	1.181	3.304	1.419	2.088	4.485	5.395	4.930
1988	1.259	0.867	0.881	2.544	2.010	6.575	1.621	2.858	3.965	4.930	4.885
1989	0.895	0.620	0.636	0.992	0.689	1.984	0.793	2.576	4.175	4.885	5.145
1990	0.975	0.684	0.637	1.082	1.136	2.224	1.461	2.541	4.330	5.145	4.820
1991	1.421	0.628	0.594	0.947	0.689	1.734	0.752	2.610	4.135	4.820	5.435
1992	0.938	0.763	1.148	1.302	0.985	3.288	1.082	2.240	4.785	5.435	4.940
1993	1.465	1.026	0.842	1.560	0.816	3.518	1.572	2.616	4.055	4.940	4.900
1994	0.794	0.835	0.757	0.952	0.774	1.497	0.919	2.400	4.265	4.900	4.190
1995	1.017	0.793	0.691	0.715	0.381	1.534	0.687	3.412	3.550	4.190	4.910
1996	1.068	1.079	0.673	1.195	0.944	2.121	0.821	3.218	4.347	4.910	4.670
1997	1.056	0.924	0.921	1.235	1.027	2.132	1.041	2.733	4.065	4.670	4.670
1998	1.086	1.002	4.116	1.304	0.935	2.376	1.091	2.230	3.665	4.670	4.160
1999	1.196	1.073	1.042	1.336	2.179	6.903	0.397	2.141	3.485	4.160	4.165
2000	1.225	0.915	0.770	1.220	1.085	4.622	1.453	2.039	3.490	4.165	3.820
2001	0.942	0.795	0.761	0.888	0.775	1.730	0.539	2.168	3.301	3.820	4.065
2002	0.812	0.645	0.711	0.813	0.855	0.862	0.704	2.669	3.452	4.065	3.965
2003	0.853	1.057	1.062	0.844	1.033	1.216	1.484	2.521	3.444	3.965	4.150
2004	1.096	0.997	0.866	0.819	1.044	1.403	0.928	2.268	3.657	4.150	3.995
2005	1.117	1.088	0.992	1.048	1.125	1.316	1.224	2.214	3.578	3.995	3.790
2006	0.721	0.672	0.758	0.757	0.645	0.694	0.816	3.063	3.335	3.790	5.250
2007	0.808	0.814	0.570	0.757	0.860	0.880	0.648	4.112	4.680	5.250	4.325
2008	0.921	0.897	0.683	0.927	1.006	0.999	0.809	4.567	3.815	4.325	4.345
2009	1.074	0.919	1.006	1.027	1.167	1.656	1.019	3.799	3.847	4.345	4.425
2010	0.686	0.740	0.736	0.613	0.660	0.589	0.518	5.185	3.875	4.425	4.570
2011	0.586	0.617	0.585	0.569	0.595	0.517	0.584	6.663	4.070	4.570	4.963
2012	0.925	0.381	0.559	0.610	0.655	0.802	1.056	7.641	4.550	5.085	5.210

Table A-2 (Continued)

Year	CRSEPAD1	CRSEYLD1	CRSEYLD2	CRSEYLE	CRSPFP	CRSPHA	CRSPPA	CRSPPA _LEAD1	CRSPYLD1	CRSPYLE	CRUSFE
1985	0.000	0.000	0.000	86.696	2.508	1.610	1.722	1.553	0.000	105.950	4,114.197
1986	0.000	0.000	0.000	87.971	1.868	1.437	1.553	1.458	0.000	106.803	4,659.467
1987	0.000	0.000	0.000	89.245	2.165	1.365	1.458	1.665	0.000	107.655	4,789.244
1988	0.000	0.000	1.000	73.475	2.721	1.477	1.665	1.830	0.000	108.507	3,933.910
1989	0.000	0.000	0.000	91.794	2.610	1.538	1.830	1.840	0.000	109.360	4,382.484
1990	0.000	0.000	1.000	76.023	2.506	1.593	1.840	1.912	0.000	110.212	4,608.907
1991	0.000	0.000	0.000	94.342	2.681	1.655	1.912	2.005	0.000	111.064	4,797.913
1992	0.000	0.000	0.000	95.617	2.402	1.826	2.005	2.288	0.000	111.917	5,252.089
1993	0.000	0.000	1.000	79.846	2.631	2.080	2.288	2.473	0.000	112.769	4,679.850
1994	0.000	0.000	0.000	98.165	2.512	2.290	2.473	2.383	0.000	113.621	5,459.661
1995	0.000	0.000	0.000	99.439	3.212	2.103	2.383	2.430	0.000	114.473	4,692.485
1996	0.000	0.000	0.000	100.714	3.154	2.024	2.430	2.335	0.000	115.326	5,277.050
1997	0.000	0.000	0.000	101.988	2.739	2.005	2.335	2.810	1.000	135.507	5,450.474
1998	0.000	0.000	0.000	103.262	2.245	2.155	2.810	2.530	0.000	117.030	5,452.395
1999	0.000	0.000	0.000	104.537	2.071	2.133	2.530	2.520	1.000	137.211	5,642.765
2000	0.000	0.000	0.000	105.811	2.183	2.206	2.520	1.980	0.000	118.735	5,822.054
2001	0.000	1.000	0.000	129.479	2.270	1.676	1.980	2.430	0.000	119.587	5,848.747
2002	0.000	0.000	0.000	108.360	2.567	2.029	2.430	2.190	0.000	120.440	5,548.312
2003	0.000	0.000	0.000	109.634	2.605	1.888	2.190	2.205	0.000	121.292	5,781.240
2004	0.000	1.000	0.000	133.302	2.585	1.938	2.205	2.480	1.000	141.473	6,135.075
2005	0.000	0.000	0.000	112.182	2.466	2.155	2.480	2.160	0.000	122.996	6,115.061
2006	1.000	0.000	0.000	113.457	3.217	1.715	2.160	2.605	0.000	123.849	5,540.132
2007	0.000	0.000	0.000	114.731	4.342	2.294	2.605	2.810	0.000	107.656	5,857.739
2008	0.000	0.000	0.000	116.005	4.792	2.405	2.810	2.870	0.000	125.553	5,181.855
2009	0.000	1.000	0.000	139.673	3.980	2.330	2.870	2.810	0.000	126.406	5,124.703
2010	0.000	0.000	0.000	118.554	4.681	2.486	2.810	2.555	0.000	110.213	4,792.935
2011	1.000	0.000	0.000	119.828	6.465	1.703	2.555	2.559	0.000	94.920	4,545.000
2012	1.000	0.000	0.000	96.463	6.686	1.910	2.335	2.930	0.000	128.963	4,400.000

Table A-2 (Continued)

Year	CRUSFI	CRUSPA _LEAD1	CRUSPR	CRUSRFP	CRUSSE	CSUSRP	DDGMP	DMOPMRR	ETDMPR	ETEXN	ETUSDE
1985	862.000	76.580	8,875.453	4.102	19.500	0.324	0.111	2.652	58,625.070	0.000	617,106.000
1986	926.720	66.200	8,225.764	2.699	16.700	0.319	0.116	2.170	94,705.044	0.000	712,068.000
1987	955.302	67.720	7,131.300	3.393	17.200	0.382	0.139	2.196	116,689.545	0.000	818,874.000
1988	991.913	72.320	4,928.681	4.295	18.400	0.337	0.141	1.619	118,383.300	0.000	830,760.000
1989	1,029.693	74.170	7,531.950	3.845	18.900	0.375	0.123	1.732	128,075.808	0.000	842,604.000
1990	1,056.749	75.960	7,934.030	3.577	19.300	0.350	0.126	1.813	127,853.964	0.000	747,684.000
1991	1,115.043	79.310	7,474.770	3.591	20.200	0.303	0.123	1.561	164,603.460	0.000	866,334.000
1992	1,111.541	73.240	9,476.700	3.063	18.700	0.369	0.122	1.757	337,814.667	0.000	985,026.000
1993	1,134.795	78.920	6,337.730	3.620	20.100	0.402	0.124	1.234	480,315.881	-10,248.000	1,151,010.000
1994	1,164.106	71.480	10,050.520	3.205	18.300	0.395	0.106	1.304	291,428.882	-11,718.000	1,288,938.000
1995	1,212.346	79.230	7,400.050	4.501	20.147	0.368	0.156	0.935	98,022.330	-16,254.000	1,382,598.000
1996	1,265.133	79.540	9,232.560	3.694	20.259	0.349	0.140	1.356	128,547.506	-13,146.000	991,704.000
1997	1,327.946	80.170	9,206.830	3.255	20.422	0.400	0.106	1.058	249,674.090	-3,570.000	1,255,758.000
1998	1,324.172	77.390	9,758.690	2.570	19.736	0.362	0.085	1.083	304,328.632	-2,772.000	1,387,596.000
1999	1,349.358	79.550	9,430.610	2.376	20.247	0.281	0.080	0.999	263,041.109	-3,654.000	1,442,700.000
2000	1,327.789	75.700	9,915.050	2.364	19.298	0.204	0.081	1.373	487,024.667	-4,872.000	1,653,414.000
2001	1,334.594	78.890	9,502.580	2.461	20.055	0.225	0.080	1.429	600,336.358	-13,230.000	1,740,690.000
2002	1,339.311	78.600	8,966.790	2.853	19.973	0.464	0.088	0.872	1,106,030.554	-12,852.000	2,073,120.000
2003	1,360.786	80.930	10,087.290	2.914	20.559	0.376	0.115	1.083	1,758,373.848	-12,264.000	2,826,012.000
2004	1,363.394	81.780	11,805.580	2.413	20.791	0.328	0.076	1.403	2,254,247.297	-148,764.000	3,552,192.000
2005	1,395.711	78.330	11,112.190	2.267	19.895	0.334	0.086	1.423	2,770,730.493	-135,828.000	4,058,628.000
2006	1,397.879	93.530	10,531.120	3.338	23.745	0.392	0.109	1.922	3,633,222.260	-731,136.000	5,481,210.000
2007	1,371.196	85.980	13,037.880	4.482	21.841	0.785	0.157	1.201	5,271,939.639	-439,194.000	6,885,690.000
2008	1,294.381	86.380	12,091.650	4.239	21.945	0.387	0.117	1.288	7,729,058.446	-529,620.000	9,683,352.000
2009	1,347.509	88.190	13,091.860	3.674	22.337	0.417	0.116	0.840	9,299,871.252	-198,240.000	11,036,592.000
2010	1,383.360	91.940	12,446.870	5.290	23.000	0.545	0.187	0.547	11,293,918.360	382,830.000	12,858,510.000
2011	1,403.665	97.160	12,358.410	6.200	24.300	0.532	0.203	0.994	11,925,926.460	1,063,524.000	12,871,488.000
2012	1,375.385	97.379	10,625.774	6.950	24.620	0.520	0.203	0.095	11,371,440.150	206,962.014	13,089,930.000

Table A-2 (Continued)

Year	ETUSRP	ETWMPR	FBEXFB	GCAU	GCCU	GCDU	GFUSMP	GMUSMP	LRDSER _LEAD1	LRDSFP	LRDSHA
1985	2.943	527,625.630	3.708	54.679	22.232	12.473	0.086	0.209	70.046	6.750	1.491
1986	1.926	581,759.556	3.744	53.306	21.441	11.722	0.098	0.235	-51.744	3.820	1.440
1987	2.116	661,240.755	3.831	55.262	22.202	11.527	0.118	0.307	98.662	7.770	1.336
1988	1.911	670,838.700	3.914	54.722	21.416	11.344	0.116	0.279	57.715	6.960	1.713
1989	2.004	672,397.992	3.908	54.207	21.644	11.225	0.099	0.237	80.824	7.590	1.560
1990	2.118	582,445.836	3.938	56.105	23.291	11.160	0.099	0.241	43.348	6.940	1.625
1991	1.924	658,413.840	3.932	56.121	22.224	10.918	0.102	0.266	81.891	7.830	1.581
1992	1.968	597,960.033	3.903	57.471	23.565	10.852	0.094	0.288	7.665	5.870	1.910
1993	1.680	616,295.719	3.928	57.988	24.022	10.685	0.089	0.281	108.072	7.930	1.630
1994	1.687	933,062.218	3.957	57.525	23.230	10.658	0.082	0.223	34.917	6.870	1.910
1995	1.597	1,191,745.170	3.945	57.503	24.072	10.588	0.119	0.326	180.088	9.370	1.884
1996	1.840	796,254.694	3.896	57.129	24.305	10.475	0.090	0.344	228.109	10.600	1.581
1997	1.540	974,218.510	3.955	59.348	24.842	10.338	0.067	0.278	217.323	10.200	1.931
1998	1.391	1,030,446.068	3.972	59.082	24.327	10.278	0.060	0.239	161.095	8.790	2.141
1999	1.279	1,128,710.791	4.021	59.548	25.445	10.323	0.052	0.237	-5.442	5.700	2.278
2000	1.725	1,054,192.633	4.015	59.575	25.693	10.322	0.061	0.252	50.534	5.840	1.803
2001	1.849	1,076,580.842	4.011	59.473	25.332	10.252	0.060	0.243	-33.578	4.100	2.263
2002	1.377	927,113.846	4.037	58.087	24.065	10.300	0.065	0.239	102.887	4.150	2.118
2003	1.626	905,828.952	4.141	59.089	25.010	10.122	0.083	0.328	233.849	7.600	1.954
2004	1.979	979,966.903	4.134	59.443	25.055	10.156	0.052	0.271	202.230	7.340	2.154
2005	2.040	938,413.407	4.270	60.661	25.802	10.293	0.056	0.269	159.720	7.300	2.311
2006	2.833	1,006,908.340	4.339	61.670	26.188	10.340	0.074	0.351	321.657	9.470	1.819
2007	2.390	923,054.061	4.348	63.817	26.413	10.474	0.120	0.526	489.974	12.400	1.724
2008	2.579	1,114,257.854	4.247	62.459	24.892	10.553	0.077	0.489	579.959	14.900	1.974
2009	1.853	1,091,046.348	4.114	61.438	24.548	10.314	0.075	0.520	488.667	12.900	1.898
2010	1.971	1,339,099.940	4.188	62.163	25.025	10.389	0.149	0.541	363.833	11.000	2.388
2011	2.700	1,325,102.940	4.229	62.821	25.490	10.466	0.166	0.542	464.363	13.400	1.438
2012	2.370	1,263,493.350	4.330	61.941	23.860	10.459	0.200	0.616	540.256	14.500	1.669

Table A-2 (Continued)

Year	LRDSPA	LRDSPA _LEAD1	LRDSPAD1	LRDSYLE	LREX	LRMRRP	LRUSRE	LRUSRFP	MRDSFP	MRDSHA	MRDSPA
1985	1.504	1.454	0.000	47.924	42.000	0.870	48.767	12.416	5.870	0.210	0.211
1986	1.454	1.350	0.000	48.710	69.900	0.929	51.204	6.874	3.550	0.204	0.206
1987	1.350	1.734	0.000	49.497	50.500	0.819	49.495	13.589	6.360	0.292	0.295
1988	1.734	1.589	0.000	50.284	71.000	0.930	55.507	11.768	6.470	0.282	0.286
1989	1.589	1.675	0.000	51.070	67.029	0.884	48.299	12.366	6.710	0.300	0.306
1990	1.675	1.664	0.000	51.857	61.579	0.892	52.184	10.887	6.190	0.370	0.375
1991	1.664	1.939	0.000	52.644	55.606	0.894	56.754	11.863	7.000	0.409	0.421
1992	1.939	1.690	0.000	53.430	69.756	1.007	55.040	8.687	5.910	0.365	0.371
1993	1.690	1.933	0.000	54.217	58.613	1.020	56.713	11.482	8.090	0.375	0.385
1994	1.933	1.898	0.000	55.004	83.720	0.975	57.180	9.742	6.700	0.443	0.447
1995	1.898	1.593	0.000	55.791	65.507	0.941	67.069	13.016	8.820	0.314	0.317
1996	1.593	1.943	0.000	56.577	57.374	0.790	61.349	14.449	8.370	0.330	0.332
1997	1.943	2.158	0.000	57.364	72.251	0.835	59.714	13.663	8.520	0.280	0.282
1998	2.158	2.288	0.000	58.151	71.448	1.044	76.708	11.643	9.180	0.232	0.237
1999	2.288	1.818	0.000	58.937	70.284	1.161	87.595	7.440	6.620	0.286	0.287
2000	1.818	2.275	1.000	59.724	65.661	0.882	75.824	7.462	5.150	0.305	0.307
2001	2.275	2.135	0.000	60.511	74.280	1.176	75.824	5.123	4.820	0.157	0.159
2002	2.135	1.970	0.000	61.297	100.710	1.422	77.685	5.103	5.900	0.173	0.176
2003	1.970	2.165	0.000	62.084	80.354	1.308	83.804	9.152	9.940	0.185	0.186
2004	2.165	2.325	1.000	62.871	83.996	0.993	84.551	8.597	7.290	0.168	0.169
2005	2.325	1.830	0.000	63.658	92.166	1.300	87.281	8.275	9.490	0.112	0.113
2006	1.830	1.732	0.000	64.444	72.000	1.278	93.444	10.399	12.100	0.115	0.116
2007	1.732	1.985	0.000	65.231	79.448	1.177	90.926	13.233	14.600	0.168	0.169
2008	1.985	1.920	0.000	66.018	67.999	1.664	100.134	15.556	24.800	0.114	0.116
2009	1.920	2.400	1.000	66.804	74.272	1.426	91.946	13.351	18.400	0.279	0.281
2010	2.400	1.475	0.000	67.591	78.037	1.709	108.475	11.234	18.800	0.235	0.236
2011	1.475	1.680	0.000	68.378	66.820	1.163	77.870	13.500	17.100	0.292	0.304
2012	1.680	1.480	0.000	69.164	94.000	1.097	94.000	14.500	15.900	0.142	0.143

Table A-2 (Continued)

Year	MRDSPA _LEAD1	MRDSPAD1	MRDSPAD2	MRDSYLE	MREX	MRFWFP	MRFWHA	MRFWPA	MRFWPA _LEAD1	MRFWPAD1	MRFWPAD2
1985	0.206	0.000	0.000	46.307	16.700	5.870	0.336	0.340	0.343	0.000	0.000
1986	0.295	0.000	0.000	47.266	14.300	3.550	0.340	0.343	0.338	0.000	0.000
1987	0.286	0.000	0.000	48.224	21.700	6.360	0.334	0.338	0.370	0.000	0.000
1988	0.306	0.000	0.000	49.182	14.903	6.470	0.365	0.370	0.385	0.000	0.000
1989	0.375	0.000	1.000	50.140	10.354	6.710	0.380	0.385	0.382	0.000	0.000
1990	0.421	0.000	1.000	51.098	9.803	6.190	0.377	0.382	0.341	0.000	0.000
1991	0.371	0.000	0.000	52.057	10.931	7.000	0.340	0.341	0.381	0.000	0.000
1992	0.385	0.000	0.000	53.015	9.451	5.910	0.379	0.381	0.426	0.000	0.000
1993	0.447	0.000	1.000	53.973	19.979	8.090	0.423	0.426	0.480	0.000	0.000
1994	0.317	0.000	0.000	54.931	18.092	6.700	0.478	0.480	0.459	0.000	0.000
1995	0.332	0.000	0.000	55.889	17.734	8.820	0.457	0.459	0.497	0.000	0.000
1996	0.282	0.000	0.000	56.848	20.932	8.370	0.495	0.497	0.509	0.000	0.000
1997	0.237	0.000	0.000	57.806	15.420	8.520	0.507	0.509	0.451	0.000	1.000
1998	0.287	0.000	0.000	58.764	15.390	9.180	0.449	0.451	0.505	1.000	0.000
1999	0.307	0.000	0.000	59.722	18.564	6.620	0.500	0.505	0.541	1.000	0.000
2000	0.159	1.000	0.000	60.680	17.553	5.150	0.539	0.541	0.460	0.000	1.000
2001	0.176	0.000	0.000	61.639	20.424	4.820	0.458	0.460	0.526	1.000	0.000
2002	0.186	0.000	0.000	62.597	23.886	5.900	0.521	0.526	0.502	0.000	0.000
2003	0.169	0.000	0.000	63.555	22.716	9.940	0.500	0.502	0.588	1.000	0.000
2004	0.113	1.000	0.000	64.513	24.851	7.290	0.583	0.588	0.519	0.000	1.000
2005	0.116	0.000	0.000	65.471	22.686	9.490	0.517	0.519	0.520	0.000	0.000
2006	0.169	0.000	0.000	66.430	18.763	12.100	0.518	0.520	0.525	0.000	0.000
2007	0.116	1.000	0.000	67.388	25.814	14.600	0.524	0.525	0.510	0.000	0.000
2008	0.281	0.000	0.000	68.346	26.385	24.800	0.508	0.510	0.556	0.000	0.000
2009	0.236	0.000	0.000	69.304	34.032	18.400	0.551	0.556	0.552	0.000	0.000
2010	0.304	0.000	0.000	70.262	33.609	18.800	0.547	0.552	0.578	0.000	0.000
2011	0.143	1.000	0.000	71.221	34.773	17.100	0.573	0.578	0.555	0.000	0.000
2012	0.141	0.000	0.000	72.179	31.000	15.900	0.550	0.555	0.555	0.000	0.000

Table A-2 (Continued)

Year	MRFWYLE	MRUSRE	MRUSRFP	MVBDMP	MVUS	NGIMP	OACRFW	OAFWFP	OAFWHA	OAFWPA	OAFWPA _LEAD1
1985	75.612	18.800	10.797	0.000	0.000	3.592	4.329	1.462	0.231	0.646	0.637
1986	75.874	26.410	6.389	0.000	0.000	2.985	2.629	1.356	0.200	0.637	0.638
1987	76.135	30.945	11.123	0.000	0.000	2.697	3.034	1.582	0.185	0.638	0.642
1988	70.257	26.914	10.939	0.000	0.000	2.719	2.714	2.207	0.194	0.642	0.716
1989	76.658	33.617	10.932	0.000	0.000	2.719	4.489	1.520	0.237	0.716	0.630
1990	76.919	39.028	9.710	0.000	0.000	2.740	4.661	1.475	0.172	0.630	0.675
1991	84.333	38.587	10.605	0.000	0.000	2.665	4.735	1.452	0.183	0.675	0.615
1992	84.594	39.564	8.746	0.000	172.000	2.772	3.864	1.553	0.145	0.615	0.552
1993	84.856	41.272	11.714	0.000	441.000	3.092	4.397	1.622	0.119	0.552	0.542
1994	85.118	41.224	9.501	0.000	605.000	2.889	3.454	1.788	0.124	0.542	0.600
1995	78.227	37.859	12.252	1.109	1,527.000	2.569	4.396	1.934	0.109	0.600	0.515
1996	78.489	40.256	11.410	1.235	4,536.000	3.230	3.295	2.109	0.114	0.515	0.598
1997	78.750	44.202	11.413	1.198	9,130.000	3.390	3.737	1.822	0.111	0.598	0.548
1998	70.583	37.369	12.159	1.044	12,788.000	3.006	4.846	1.328	0.118	0.548	0.473
1999	70.844	34.288	8.641	1.121	24,604.000	3.251	4.237	1.339	0.092	0.473	0.438
2000	79.534	41.687	6.580	1.491	87,570.000	4.839	4.357	1.374	0.092	0.438	0.539
2001	79.796	35.991	6.022	1.401	100,303.000	5.180	3.377	1.947	0.089	0.539	0.550
2002	80.058	36.313	7.254	1.319	120,951.000	4.061	2.606	2.360	0.105	0.550	0.543
2003	80.319	31.150	11.970	1.509	179,090.000	6.118	4.969	1.868	0.102	0.543	0.462
2004	80.581	38.141	8.538	1.810	211,800.000	6.736	4.024	1.751	0.081	0.462	0.477
2005	80.842	32.551	10.758	2.402	246,363.000	8.728	5.163	1.924	0.074	0.477	0.487
2006	81.104	34.638	13.287	2.705	297,099.000	7.727	5.445	2.222	0.076	0.487	0.412
2007	81.365	35.924	15.580	2.885	364,384.000	7.577	3.791	3.077	0.077	0.412	0.437
2008	81.626	27.506	25.891	3.803	450,327.000	9.410	3.914	3.264	0.072	0.437	0.442
2009	81.888	32.543	19.043	2.467	504,297.000	4.828	3.533	2.927	0.089	0.442	0.397
2010	82.149	29.351	19.201	2.992	618,505.000	5.691	6.076	2.569	0.077	0.397	0.352
2011	82.411	32.232	15.700	3.840	650,000.000	5.127	4.771	3.396	0.050	0.352	0.382
2012	82.673	31.000	15.900	3.900	700,000.000	3.860	2.062	3.776	0.068	0.382	0.417
Mean	79.343	34.620	11.859	1.365	163,731.857	4.436	4.032	2.036	0.121	0.534	0.526
S.E.	4.092	5.668	4.348	1.315	227,175.549	2.015	0.933	0.686	0.052	0.097	0.097

Table A-2 (Continued)

Year	OAFWYLD1	OAFWYLE	OALSFP	OALSHA	OALSPA	OALSPA _LEAD1	OALSYLD1	OALSYLE	OANPFP	OANPHA	OANPPA
1985	0.000	74.475	1.217	2.270	2.920	3.130	0.000	68.165	1.078	2.375	3.396
1986	0.000	79.570	1.197	1.970	3.130	3.750	0.000	58.391	1.252	1.894	2.842
1987	0.000	74.658	1.566	1.900	3.750	3.050	0.000	58.609	1.636	2.005	2.760
1988	0.000	79.754	2.539	1.530	3.050	2.520	1.000	43.864	2.485	1.325	2.780
1989	0.000	79.846	1.431	1.860	2.520	2.250	0.000	59.045	1.379	1.925	2.917
1990	0.000	79.937	1.100	1.665	2.250	1.650	0.000	59.263	1.024	1.655	2.470
1991	0.000	80.029	1.209	1.220	1.650	1.635	1.000	44.518	1.148	1.492	2.155
1992	0.000	80.121	1.315	1.175	1.635	1.790	0.000	59.699	1.221	1.320	1.900
1993	0.000	80.213	1.374	1.130	1.790	1.415	1.000	44.953	1.275	1.150	1.745
1994	0.000	80.305	1.227	1.030	1.415	1.325	0.000	60.134	1.139	1.209	1.805
1995	0.000	80.396	1.646	0.805	1.325	0.820	1.000	45.389	1.668	0.813	1.213
1996	0.000	80.488	1.931	0.630	0.820	1.005	0.000	60.570	1.790	0.822	1.140
1997	0.000	80.580	1.506	0.700	1.005	0.890	0.000	60.788	1.438	0.800	1.290
1998	0.000	80.672	1.099	0.710	0.890	0.890	0.000	61.006	1.007	0.802	1.350
1999	0.000	80.764	1.029	0.675	0.890	0.895	0.000	61.224	1.021	0.627	1.200
2000	0.000	80.855	1.018	0.665	0.895	0.670	0.000	69.063	0.996	0.612	1.145
2001	1.000	69.841	1.498	0.460	0.670	0.930	0.000	61.660	1.675	0.458	1.130
2002	0.000	81.039	1.668	0.580	0.930	0.820	0.000	61.878	1.815	0.485	1.345
2003	1.000	70.024	1.448	0.570	0.820	0.730	0.000	69.716	1.400	0.658	1.220
2004	0.000	81.223	1.459	0.465	0.730	0.800	0.000	62.313	1.368	0.445	1.025
2005	1.000	70.208	1.563	0.495	0.800	0.740	0.000	62.531	1.569	0.467	1.015
2006	0.000	81.406	1.857	0.495	0.740	0.610	0.000	62.749	1.999	0.251	0.918
2007	0.000	81.498	2.530	0.395	0.610	0.595	0.000	62.967	2.668	0.433	0.905
2008	0.000	81.590	2.800	0.425	0.595	0.630	0.000	63.185	2.741	0.292	0.630
2009	0.000	88.644	1.880	0.420	0.630	0.645	0.000	63.403	2.037	0.297	0.660
2010	0.000	88.736	2.370	0.395	0.645	0.430	0.000	63.621	2.698	0.246	0.569
2011	0.000	88.827	3.257	0.255	0.430	0.460	0.000	63.839	3.239	0.186	0.365
2012	0.000	88.919	3.727	0.300	0.460	0.520	0.000	64.057	3.515	0.184	0.435

Table A-2 (Continued)

Year	OANPPA _LEAD1	OANPYLE	OASOSP	OASPFP	OASPHA	OASPPA	OASPPA _LEAD1	OASPYLD1	OASPYLE	OAUSFE	OAUSFE _LAG1
1985	2.842	49.809	1.718	1.935	0.365	1.355	1.200	0.000	42.036	464.156	436.000
1986	2.760	50.350	1.379	1.564	0.300	1.200	1.260	0.000	42.142	384.399	464.156
1987	2.780	50.891	0.981	1.953	0.280	1.260	1.240	0.000	42.249	358.246	384.399
1988	2.917	30.243	1.598	2.346	0.265	1.240	1.230	0.000	42.355	193.591	358.246
1989	2.470	30.784	2.623	2.069	0.260	1.230	1.200	1.000	33.297	282.590	193.591
1990	2.155	52.513	3.374	1.562	0.285	1.200	1.180	0.000	42.567	311.734	282.590
1991	1.900	53.054	3.935	1.448	0.214	1.180	0.810	0.000	42.673	265.822	311.734
1992	1.745	63.391	1.703	1.619	0.180	0.810	0.880	0.000	42.780	263.116	265.822
1993	1.805	63.931	1.677	1.573	0.170	0.880	0.730	0.000	50.029	230.221	263.116
1994	1.213	54.676	1.645	1.763	0.160	0.730	0.710	1.000	42.992	242.564	230.221
1995	1.140	55.217	2.038	2.138	0.140	0.710	0.700	0.000	43.098	194.871	242.564
1996	1.290	55.758	0.915	3.377	0.118	0.700	0.625	1.000	34.041	171.758	194.871
1997	1.350	56.299	0.787	2.306	0.170	0.625	0.660	0.000	50.454	184.650	171.758
1998	1.200	56.840	0.772	1.478	0.150	0.660	0.745	0.000	50.560	195.379	184.650
1999	1.145	57.380	0.483	1.574	0.140	0.745	0.660	0.000	43.523	179.465	195.379
2000	1.130	57.921	0.751	1.600	0.115	0.660	0.780	0.000	43.629	188.776	179.465
2001	1.345	58.462	-0.011	2.177	0.170	0.780	0.835	0.000	43.735	148.270	188.776
2002	1.220	44.742	2.062	1.761	0.160	0.835	0.695	0.000	43.842	149.933	148.270
2003	1.025	59.544	1.313	2.150	0.165	0.695	0.730	0.000	43.948	143.723	149.933
2004	1.015	60.084	2.161	1.893	0.175	0.730	0.735	0.000	44.054	136.253	143.723
2005	0.918	60.625	0.723	2.352	0.120	0.735	0.795	0.000	44.160	135.653	136.253
2006	0.905	46.905	-4.434	2.428	0.108	0.795	0.790	1.000	35.568	124.947	135.653
2007	0.630	61.707	1.587	3.463	0.115	0.790	0.650	0.000	44.373	120.156	124.947
2008	0.660	62.248	0.597	3.963	0.110	0.650	0.650	0.000	44.479	108.056	120.156
2009	0.569	62.788	0.349	4.263	0.075	0.650	0.595	0.000	44.585	115.179	108.056
2010	0.365	63.329	1.472	4.111	0.089	0.595	0.585	0.000	44.691	102.201	115.179
2011	0.435	63.870	1.482	5.570	0.065	0.585	0.575	1.000	36.099	81.922	102.201
2012	0.575	64.411	1.598	5.789	0.085	0.575	0.550	0.000	44.904	100.000	81.922

Table A-2 (Continued)

Year	OAUSPA _LEAD1	OAUSPR	OAUSRFP	OAUSSE	OAWHRP	PECRUMRR	PEEX	PEEXD1	PESEHA	PESEPA	PESEPA _LEAD1
1985	14.670	518.490	2.262	32.500	2.504	-0.100	1,045.700	1.000	1.127	1.139	1.235
1986	17.910	385.000	2.178	38.000	2.000	-0.219	664.860	1.000	1.214	1.235	1.201
1987	13.910	373.710	2.728	31.600	1.647	-0.113	619.600	0.000	1.184	1.201	1.285
1988	12.090	217.380	4.413	27.100	1.425	-0.100	689.400	0.000	1.268	1.285	1.283
1989	10.420	373.590	2.428	23.400	2.497	-0.026	990.460	1.000	1.267	1.283	1.424
1990	8.650	357.650	1.788	19.100	2.289	-0.150	654.900	1.000	1.401	1.424	1.577
1991	7.940	243.850	1.833	17.800	2.479	-0.169	1,001.800	1.000	1.562	1.577	1.258
1992	7.940	294.230	1.953	17.200	2.455	-0.183	951.000	1.000	1.245	1.258	1.302
1993	6.640	206.730	1.969	15.000	2.397	-0.067	532.550	0.000	1.271	1.302	1.223
1994	6.230	228.840	1.730	13.400	2.828	-0.061	878.100	0.000	1.210	1.223	1.143
1995	4.640	161.090	2.320	11.985	2.725	-0.065	826.000	0.000	1.129	1.143	1.030
1996	5.070	153.250	2.672	13.067	2.194	-0.015	668.480	0.000	1.018	1.030	1.017
1997	4.890	167.250	2.143	12.548	2.112	0.009	681.900	0.000	1.004	1.017	1.049
1998	4.670	165.770	1.457	11.963	2.409	-0.089	562.100	0.000	1.035	1.049	1.069
1999	4.470	145.630	1.462	11.489	2.214	-0.072	742.600	0.000	1.055	1.069	0.988
2000	4.400	149.170	1.405	11.270	2.382	-0.096	527.200	0.000	0.968	0.988	1.014
2001	5.000	117.600	1.987	12.802	1.748	-0.062	699.700	0.000	1.003	1.014	0.960
2002	4.600	116.000	2.225	11.759	1.967	0.093	489.900	0.000	0.937	0.960	1.014
2003	4.090	144.380	1.782	10.509	2.297	0.169	515.900	0.000	0.990	1.014	1.138
2004	4.250	115.700	1.733	10.980	2.297	0.112	491.000	0.000	1.109	1.138	1.323
2005	4.170	114.860	1.848	10.799	2.098	0.078	491.000	0.000	1.303	1.323	1.036
2006	3.760	93.520	2.053	9.657	2.278	0.133	603.000	0.000	1.015	1.036	0.993
2007	3.250	90.430	2.807	8.481	2.464	0.345	750.147	0.000	0.963	0.993	1.228
2008	3.400	89.140	3.289	8.864	2.152	0.145	726.560	0.000	1.207	1.228	0.909
2009	3.140	93.080	2.091	8.208	2.411	0.115	592.252	0.000	0.886	0.909	1.072
2010	2.500	81.190	2.574	6.750	2.262	0.208	605.584	0.000	1.043	1.072	0.990
2011	2.760	53.650	3.490	8.773	2.074	0.223	545.000	0.000	0.946	0.990	1.402
2012	2.932	64.024	3.850	8.800	2.026	0.166	1,200.000	0.000	1.371	1.402	0.969

Table A-2 (Continued)

Year	PESEPAD1	PESEYLD1	PESEYLE	PEUSCRU	PEUSCRUD1	PEUSCRUD2	PEUSFA	PEUSRFP	PEUSSE	PEUSSED1	POULTRY
1985	0.000	0.000	2,498.009	812.493	0.000	0.000	2,023.000	0.447	822.594	0.000	19.783
1986	0.000	0.000	2,524.534	513.896	0.000	0.000	2,073.000	0.525	289.329	0.000	20.968
1987	0.000	0.000	2,551.060	560.215	0.000	0.000	2,071.140	0.490	537.096	0.000	21.472
1988	0.000	0.000	2,577.586	814.226	0.000	0.000	2,254.691	0.472	215.678	1.000	22.046
1989	0.000	0.000	2,604.111	624.237	0.000	0.000	2,312.438	0.456	208.810	1.000	23.083
1990	0.000	0.000	1,957.945	688.557	0.000	0.000	2,019.968	0.544	285.136	0.000	23.889
1991	0.000	0.000	2,657.162	1,102.551	1.000	0.000	2,207.205	0.429	248.778	1.000	24.578
1992	0.000	0.000	2,683.688	891.023	1.000	0.000	2,121.891	0.444	27.297	1.000	25.290
1993	0.000	0.000	2,037.522	669.886	0.000	0.000	2,088.073	0.440	392.925	0.000	26.013
1994	0.000	0.000	2,736.739	981.834	1.000	0.000	2,009.231	0.410	315.090	0.000	26.853
1995	0.000	0.000	2,763.265	999.204	1.000	0.000	1,992.854	0.407	236.370	1.000	27.512
1996	0.000	0.000	2,789.790	692.149	0.000	0.000	2,029.469	0.383	360.767	0.000	28.212
1997	0.000	0.000	2,816.316	544.301	0.000	0.000	2,098.504	0.379	302.107	0.000	28.607
1998	0.000	0.000	2,842.842	459.947	0.000	0.000	2,152.800	0.376	400.840	0.000	29.062
1999	0.000	1.000	2,422.792	713.098	0.000	0.000	2,233.394	0.332	478.878	0.000	29.439
2000	0.000	1.000	2,449.318	547.372	0.000	0.000	2,183.600	0.350	359.805	0.000	29.862
2001	0.000	0.000	2,922.418	693.160	0.000	1.000	2,225.100	0.292	481.713	0.000	30.298
2002	0.000	1.000	2,502.369	856.778	0.000	1.000	2,241.200	0.224	409.820	0.000	30.149
2003	0.000	0.000	2,975.470	535.934	0.000	0.000	2,455.900	0.232	428.710	0.000	30.349
2004	1.000	0.000	3,001.995	393.373	0.000	0.000	2,600.000	0.221	547.031	0.000	30.700
2005	0.000	0.000	3,028.521	542.397	0.000	0.000	2,616.000	0.196	500.508	0.000	30.829
2006	0.000	0.000	3,055.046	512.549	0.000	0.000	2,585.400	0.194	470.772	0.000	31.079
2007	1.000	0.000	3,081.572	496.063	0.000	0.000	2,516.530	0.219	471.263	0.000	31.301
2008	0.000	0.000	3,108.098	444.614	0.000	0.000	2,571.317	0.240	406.904	0.000	30.288
2009	0.000	0.000	3,134.623	434.616	0.000	0.000	2,674.875	0.225	363.000	0.000	30.164
2010	0.000	0.000	3,161.149	586.553	0.000	0.000	2,839.700	0.230	502.000	0.000	30.209
2011	1.000	0.000	3,651.939	604.000	0.000	1.000	2,805.000	0.300	472.000	0.000	29.710
2012	0.000	0.000	3,678.464	742.000	0.000	1.000	2,904.000	0.300	606.000	0.000	29.380

Table A-2 (Continued)

Year	RFCOMP	RFCORP	SBCBFP	SBCBHA	SBCBPA	SBCBPA _LEAD1	SBCBYLE	SBCOSE	SBCPFP	SBCPHA	SBCPPA
1985	26.750	49.204	5.064	30.710	31.000	30.950	37.197	2.083	4.891	3.770	3.900
1986	14.550	26.184	4.787	30.570	30.950	30.100	37.600	1.009	4.575	4.190	4.350
1987	17.900	31.304	5.933	29.780	30.100	29.450	38.004	1.015	5.672	4.460	4.550
1988	14.670	24.804	7.438	28.930	29.450	30.200	28.038	0.386	7.290	4.360	4.450
1989	17.970	29.278	5.702	30.010	30.200	29.100	38.811	1.393	5.450	4.410	4.500
1990	22.220	34.857	5.761	28.810	29.100	30.650	39.215	1.549	5.619	4.310	4.400
1991	19.060	28.876	5.624	30.330	30.650	30.300	39.618	1.016	5.498	4.360	4.500
1992	18.430	27.275	5.600	30.050	30.300	31.200	40.022	0.951	5.390	4.310	4.400
1993	16.410	23.761	6.398	29.860	31.200	31.500	40.426	0.115	6.278	4.400	4.600
1994	15.590	22.107	5.509	31.330	31.500	32.700	40.829	3.595	5.301	4.960	5.050
1995	17.230	23.934	6.757	32.470	32.700	33.400	41.233	0.701	6.604	5.110	5.200
1996	20.710	28.231	7.413	33.200	33.400	35.100	41.636	1.238	7.183	5.010	5.100
1997	19.040	25.504	6.463	34.840	35.100	36.100	42.040	1.185	6.333	5.900	6.000
1998	12.520	16.583	4.931	35.790	36.100	37.000	42.444	2.081	4.877	6.250	6.350
1999	17.510	22.857	4.660	36.700	37.000	36.300	42.847	-0.814	4.489	7.050	7.150
2000	28.260	36.107	4.572	36.050	36.300	36.850	43.251	0.909	4.453	7.075	7.600
2001	22.950	28.675	4.431	36.610	36.850	36.650	43.654	-1.007	4.182	7.630	7.800
2002	24.100	29.632	5.583	36.440	36.650	35.650	44.058	0.060	5.445	7.120	7.450
2003	28.530	34.356	7.549	35.410	35.650	35.150	34.863	0.790	7.177	6.980	7.150
2004	36.980	43.312	5.746	34.950	35.150	34.400	44.865	0.428	5.489	7.460	7.600
2005	50.240	56.952	5.679	34.220	34.400	35.750	45.269	0.481	5.519	7.510	7.600
2006	60.240	66.150	6.572	35.560	35.750	30.700	45.672	0.326	6.140	8.090	8.200
2007	67.940	72.501	10.296	30.610	30.700	34.100	46.076	0.191	9.975	6.460	6.520
2008	94.740	98.908	10.151	33.730	34.100	34.350	46.480	0.097	9.651	8.110	8.200
2009	59.290	61.363	9.687	34.150	34.350	34.000	46.883	0.608	9.442	8.410	8.500
2010	76.690	78.325	11.520	33.770	34.000	33.500	47.287	1.184	11.170	9.350	9.450
2011	101.870	101.870	11.660	33.180	33.500	33.550	47.690	1.081	11.370	8.600	8.900
2012	100.930	100.930	15.308	33.060	33.550	34.400	39.478	0.509	14.356	8.700	9.050

Table A-2 (Continued)

Year	SBCPPA _LEAD1	SBCPYLE	SBCRCB	SBCRCP	SBCRDS	SBCRLS	SBCRNE	SBCRNP	SBCRUMRF P	SBDSFP	SBDSHA
1985	4.350	30.013	1.020	1.783	1.711	0.905	1.137	0.314	0.174	5.143	8.420
1986	4.550	30.601	0.572	1.000	0.730	0.479	0.609	-0.038	0.222	4.931	7.500
1987	4.450	31.189	0.697	1.069	0.792	0.651	0.847	0.303	0.399	5.814	7.350
1988	4.500	31.777	0.795	1.154	1.136	0.393	0.497	0.152	0.117	7.517	7.400
1989	4.400	32.365	1.118	1.613	1.573	1.008	1.452	0.504	0.237	5.923	6.950
1990	4.500	32.952	1.025	1.462	1.569	0.924	0.881	0.450	0.167	5.937	7.000
1991	4.400	33.540	0.704	1.592	1.682	1.056	1.451	0.577	0.199	5.726	6.060
1992	4.600	34.128	1.066	1.310	0.871	0.768	1.015	0.304	0.239	5.660	6.080
1993	5.050	34.716	0.683	0.975	1.187	0.641	1.225	0.284	0.181	6.582	6.800
1994	5.200	41.280	1.260	1.197	1.322	1.050	1.291	0.668	0.260	5.639	6.390
1995	5.100	35.891	0.984	1.261	1.447	1.399	2.626	0.652	0.242	6.790	6.240
1996	6.000	42.456	0.936	0.927	1.486	0.837	1.059	0.472	0.214	7.371	6.330
1997	6.350	37.067	0.947	1.082	1.085	0.810	0.974	0.469	0.138	6.904	7.020
1998	7.150	37.655	0.921	0.998	0.243	0.767	1.070	0.421	0.125	5.492	6.470
1999	7.600	38.243	0.836	0.932	0.959	0.748	0.459	0.145	0.243	4.858	6.190
2000	7.800	31.723	0.816	1.093	1.299	0.820	0.922	0.216	0.267	4.744	5.580
2001	7.450	39.418	1.061	1.258	1.315	1.126	1.290	0.578	0.326	4.378	4.580
2002	7.150	32.899	1.231	1.551	1.407	1.231	1.169	1.161	0.232	5.598	4.910
2003	7.600	40.594	1.173	0.946	0.941	1.184	0.968	0.823	0.284	6.924	5.060
2004	7.600	41.182	0.912	1.003	1.154	1.222	0.958	0.713	0.222	6.032	5.780
2005	8.200	41.769	0.895	0.919	1.008	0.954	0.889	0.760	0.215	5.928	5.440
2006	6.520	42.357	1.387	1.489	1.320	1.320	1.549	1.442	0.307	6.289	5.560
2007	8.200	42.945	1.238	1.229	1.754	1.321	1.162	1.137	0.368	8.731	4.860
2008	8.500	43.533	1.085	1.115	1.465	1.079	0.994	1.001	0.145	9.506	6.160
2009	9.450	44.121	0.931	1.088	0.994	0.974	0.857	0.604	0.193	9.523	6.240
2010	8.900	44.708	1.458	1.351	1.358	1.631	1.516	1.698	0.268	10.660	6.150
2011	9.050	45.296	1.705	1.619	1.709	1.759	1.680	1.935	0.244	11.800	6.060
2012	8.750	32.816	1.081	2.622	1.789	1.640	1.527	1.247	0.138	15.768	6.220

Table A-2 (Continued)

Year	SBDSPA	SBDSPA _LEAD1	SBDSYLE	SBEX	SBEX _LAG1	SBEXD1	SBLSFP	SBLSHA	SBLSPA	SBLSPA _LEAD1	SBLSYLE
1985	8.700	7.880	21.640	741.000	598.000	0.000	4.965	6.380	6.550	6.050	35.538
1986	7.880	7.550	22.314	757.000	741.000	0.000	4.704	5.900	6.050	6.130	35.794
1987	7.550	7.650	22.989	804.000	757.000	0.000	5.999	6.060	6.130	6.580	36.051
1988	7.650	7.450	23.663	527.000	804.000	1.000	7.291	6.400	6.580	6.570	26.115
1989	7.450	7.250	24.337	622.000	527.000	1.000	5.572	6.490	6.570	6.290	36.565
1990	7.250	6.300	25.011	557.000	622.000	1.000	5.561	6.170	6.290	7.470	36.822
1991	6.300	6.220	25.685	684.000	557.000	0.000	5.422	7.290	7.470	7.700	37.079
1992	6.220	6.950	32.644	771.000	684.000	0.000	5.506	7.530	7.700	7.460	37.336
1993	6.950	6.500	27.033	588.000	771.000	1.000	6.244	7.030	7.460	8.110	27.400
1994	6.500	6.370	27.707	840.000	588.000	0.000	5.401	7.970	8.110	8.230	37.850
1995	6.370	6.450	28.381	849.000	840.000	0.000	6.578	8.090	8.230	8.570	38.107
1996	6.450	7.150	29.055	886.000	849.000	0.000	7.241	8.410	8.570	9.510	38.363
1997	7.150	6.800	29.730	874.000	886.000	0.000	6.273	9.410	9.510	9.950	38.620
1998	6.800	6.370	23.962	805.000	874.000	0.000	4.736	9.790	9.950	10.300	38.877
1999	6.370	5.980	31.078	973.000	805.000	0.000	4.494	10.140	10.300	10.900	39.134
2000	5.980	4.700	24.213	995.871	973.000	0.000	4.417	10.680	10.900	11.050	39.391
2001	4.700	5.190	32.426	1,063.651	995.871	0.000	4.343	10.900	11.050	10.790	39.648
2002	5.190	5.120	33.100	1,044.372	1,063.651	0.000	5.444	10.660	10.790	11.220	39.905
2003	5.120	5.970	33.774	886.551	1,044.372	0.000	7.246	11.110	11.220	10.900	32.271
2004	5.970	5.520	34.448	1,097.156	886.551	0.000	5.833	10.580	10.900	10.510	32.528
2005	5.520	5.650	35.122	939.879	1,097.156	0.000	5.580	10.370	10.510	11.000	44.211
2006	5.650	4.925	35.796	1,116.496	939.879	0.000	6.229	10.880	11.000	9.550	44.468
2007	4.925	6.350	36.471	1,158.829	1,116.496	0.000	10.055	9.460	9.550	10.560	41.189
2008	6.350	6.600	37.145	1,279.294	1,158.829	0.000	10.007	10.450	10.560	10.830	41.446
2009	6.600	6.220	37.819	1,499.049	1,279.294	0.000	9.453	10.730	10.830	11.090	41.703
2010	6.220	6.180	38.493	1,501.309	1,499.049	0.000	10.919	10.980	11.090	10.670	41.960
2011	6.180	6.330	39.167	1,362.000	1,501.309	0.000	11.407	10.590	10.670	10.760	42.217
2012	6.330	6.430	39.841	1,345.000	1,362.000	0.000	14.532	10.660	10.760	10.380	42.474

Table A-2 (Continued)

Year	SBNEFP	SBNEHA	SBNEPA	SBNEPA _LEAD1	SBNEYLD1	SBNEYLE	SBNPFP	SBNPHA	SBNPPA	SBNPPA _LEAD1	SBNPYLD1
1985	4.937	0.954	0.975	0.945	0.000	29.312	4.798	1.760	1.780	1.825	0.000
1986	4.831	0.922	0.945	0.955	0.000	29.725	4.594	1.800	1.825	1.920	0.000
1987	5.961	0.934	0.955	1.050	0.000	30.139	5.343	1.905	1.920	2.510	0.000
1988	7.527	1.028	1.050	1.250	0.000	30.553	7.150	2.420	2.510	2.540	0.000
1989	5.604	1.218	1.250	1.095	0.000	30.966	5.361	2.510	2.540	2.450	0.000
1990	5.647	1.077	1.095	1.200	0.000	37.068	5.538	2.415	2.450	2.835	0.000
1991	5.491	1.173	1.200	1.195	0.000	31.793	5.347	2.790	2.835	3.000	0.000
1992	5.481	1.173	1.195	1.250	0.000	32.207	5.210	2.940	3.000	2.450	0.000
1993	6.421	1.227	1.250	1.255	0.000	32.621	6.047	2.290	2.450	3.070	0.000
1994	5.378	1.232	1.255	1.245	0.000	33.034	5.115	3.010	3.070	3.210	1.000
1995	6.878	1.196	1.245	1.120	1.000	25.155	6.322	3.140	3.210	3.550	0.000
1996	7.010	1.101	1.120	1.268	0.000	33.861	7.074	3.515	3.550	4.450	0.000
1997	6.867	1.245	1.268	1.305	0.000	34.275	6.108	4.390	4.450	4.950	0.000
1998	5.123	1.281	1.305	1.300	0.000	34.689	4.611	4.875	4.950	5.450	1.000
1999	4.587	1.257	1.300	1.376	1.000	26.809	4.296	5.410	5.450	6.300	1.000
2000	4.458	1.358	1.376	1.405	0.000	41.815	4.259	6.220	6.300	6.650	0.000
2001	4.259	1.386	1.405	1.348	0.000	35.929	4.104	6.580	6.650	6.920	0.000
2002	5.760	1.303	1.348	1.241	1.000	28.050	5.326	6.720	6.920	7.400	0.000
2003	7.538	1.224	1.241	1.439	0.000	36.757	6.813	7.250	7.400	7.900	0.000
2004	5.395	1.421	1.439	1.398	0.000	43.469	5.643	7.690	7.900	6.850	0.000
2005	5.519	1.368	1.398	1.385	0.000	37.584	5.381	6.750	6.850	7.850	0.000
2006	6.326	1.367	1.385	1.302	0.000	37.997	6.006	7.720	7.850	6.350	0.000
2007	10.962	1.272	1.302	1.466	0.000	38.411	9.613	6.300	6.350	7.900	0.000
2008	9.821	1.442	1.466	1.484	0.000	38.825	9.676	7.820	7.900	8.150	0.000
2009	9.405	1.463	1.484	1.539	0.000	39.238	9.212	8.060	8.150	8.300	0.000
2010	11.905	1.522	1.539	1.528	0.000	39.652	10.900	8.210	8.300	8.100	0.000
2011	11.584	1.505	1.528	1.607	0.000	40.065	11.303	8.030	8.100	9.500	0.000
2012	15.373	1.584	1.607	1.628	0.000	40.479	14.745	9.350	9.500	9.200	0.000

Table A-2 (Continued)

Year	SBNPYLE	SBPESE	SBSEFP	SBSEHA	SBSEPA	SBSEPA _LEAD1	SBSEYLD1	SBSEYLE	SBUSCRU	SBUSPA _LEAD1	SBUSRFP
1985	29.222	4.820	5.071	9.125	9.710	7.910	0.000	24.883	1,053.000	60.405	9.289
1986	29.367	6.220	4.881	7.040	7.910	6.555	0.000	25.288	1,179.000	58.180	8.602
1987	29.513	4.580	5.786	6.293	6.555	6.620	0.000	25.692	1,174.000	58.840	10.283
1988	21.278	3.170	7.505	6.340	6.620	7.510	0.000	26.097	1,058.000	60.820	12.545
1989	29.805	5.483	5.771	7.250	7.510	6.740	0.000	26.502	1,146.000	57.795	9.270
1990	29.950	3.892	5.793	6.310	6.740	5.785	0.000	26.906	1,187.000	59.180	9.004
1991	30.096	4.991	5.647	5.603	5.785	5.735	0.000	27.311	1,254.000	59.180	8.454
1992	30.242	6.249	5.559	5.540	5.735	5.665	0.000	27.715	1,279.000	60.085	8.228
1993	22.007	2.909	6.509	5.235	5.665	5.615	0.000	28.120	1,276.000	61.620	9.267
1994	36.056	5.902	5.506	5.417	5.615	5.000	0.000	28.525	1,405.000	62.495	7.771
1995	30.679	4.092	6.931	4.783	5.000	5.415	0.000	28.929	1,370.000	64.195	9.335
1996	30.824	3.555	7.214	5.228	5.415	5.767	0.000	29.334	1,436.000	70.005	10.019
1997	30.970	4.163	6.710	5.575	5.767	5.660	0.000	29.738	1,597.000	72.025	8.667
1998	36.639	6.582	5.183	5.375	5.660	5.280	0.000	30.143	1,590.000	73.730	6.530
1999	36.784	13.215	4.686	4.959	5.280	5.080	0.000	21.323	1,578.000	74.266	6.044
2000	31.407	5.198	4.585	4.895	5.080	4.945	0.000	30.952	1,639.670	74.075	5.801
2001	31.553	6.159	4.401	4.809	4.945	5.105	0.000	31.357	1,699.733	73.963	5.473
2002	31.699	1.274	5.667	4.879	5.105	5.153	0.000	31.761	1,614.787	73.404	6.799
2003	31.844	1.262	7.318	5.012	5.153	5.639	1.000	36.986	1,529.699	75.208	8.839
2004	31.990	2.110	5.657	5.517	5.639	5.169	1.000	37.391	1,696.081	72.032	6.723
2005	32.136	2.068	5.722	5.058	5.169	5.152	0.000	32.975	1,738.852	75.522	6.416
2006	32.281	1.630	6.510	5.055	5.152	5.109	0.000	33.380	1,807.706	64.741	7.061
2007	37.483	1.463	10.522	4.912	5.109	6.512	0.000	25.533	1,803.407	75.718	10.778
2008	32.573	1.085	9.523	6.404	6.512	6.917	0.000	34.189	1,661.922	77.451	10.409
2009	37.775	0.913	9.727	6.739	6.917	6.100	1.000	39.414	1,751.686	77.404	9.925
2010	32.864	1.414	11.532	5.968	6.100	5.563	0.000	26.746	1,648.043	74.976	11.541
2011	33.010	1.690	11.641	5.456	5.563	5.861	0.000	35.403	1,703.000	77.203	12.500
2012	33.156	1.948	15.962	5.714	5.861	6.375	0.000	35.807	1,615.000	77.163	14.300

Table A-2 (Continued)

Year	SBUSRP	SBUSSE	SFUSPPI	SLCSRP	SLEX	SLUSPR	SLUSRE	SMUSPR	SMUSRE	SMUSRFP	SOCPFP
1985	0.843	84.748	100.000	0.976	1,257.000	11,617.272	10,053.876	24.951	19.090	0.306	1.923
1986	0.926	106.476	96.796	1.153	1,187.000	12,783.104	10,832.699	27.758	20.435	0.319	1.338
1987	1.195	94.693	96.157	0.963	1,874.000	12,974.542	10,927.173	28.060	21.323	0.419	1.597
1988	1.220	88.288	101.822	0.945	1,661.000	11,737.045	10,590.539	24.943	19.497	0.427	2.195
1989	0.739	101.050	109.727	1.034	1,353.000	13,003.582	12,082.491	27.719	22.194	0.304	2.017
1990	0.971	95.536	111.611	1.064	808.000	13,408.047	12,136.128	28.325	22.775	0.285	2.021
1991	0.939	102.588	110.146	1.046	1,644.000	14,344.699	12,248.152	29.831	22.854	0.287	2.234
1992	0.973	128.564	108.156	1.175	1,461.000	13,778.489	13,012.032	30.364	24.086	0.287	1.806
1993	1.126	95.301	108.366	1.030	1,531.000	13,951.211	12,939.545	30.514	25.163	0.279	2.304
1994	0.839	149.652	108.994	1.013	2,683.000	15,612.856	12,913.533	33.269	26.427	0.231	1.990
1995	1.201	111.066	114.543	1.074	991.807	15,239.949	13,464.780	32.527	26.549	0.328	3.084
1996	1.073	118.803	116.532	1.136	2,033.339	15,752.100	14,267.138	34.211	27.222	0.369	2.292
1997	0.865	154.790	116.218	1.157	3,079.212	18,142.796	15,261.745	38.176	28.619	0.248	2.133
1998	0.753	200.852	115.066	1.380	2,371.623	18,078.100	15,651.951	37.797	30.103	0.184	1.612
1999	0.926	165.249	108.680	1.380	1,374.593	17,824.747	16,059.096	37.591	30.080	0.219	1.483
2000	0.960	168.252	112.135	1.134	1,401.022	18,419.700	16,318.220	39.385	31.264	0.222	1.795
2001	0.943	169.304	113.601	1.093	2,519.342	18,898.235	16,833.150	40.292	32.567	0.210	1.814
2002	1.242	131.381	111.088	1.713	2,263.348	18,430.248	17,080.896	38.194	32.074	0.223	2.373
2003	1.300	109.072	111.297	1.041	935.980	17,080.411	16,865.618	36.324	31.449	0.308	2.354
2004	0.761	192.806	111.507	1.217	1,323.652	19,359.734	17,438.951	40.715	33.561	0.214	1.664
2005	0.954	199.396	117.579	1.259	1,153.354	20,387.421	17,958.608	41.244	33.195	0.197	1.698
2006	1.100	157.074	120.406	1.151	1,876.619	20,488.994	18,574.448	43.032	34.355	0.226	3.332
2007	1.526	93.528	119.569	1.414	2,911.048	20,579.831	18,334.765	42.284	33.232	0.358	4.039
2008	0.966	105.890	121.872	1.154	2,193.438	18,744.968	16,265.204	39.102	30.752	0.346	3.153
2009	0.954	110.286	118.522	1.120	3,358.667	19,615.314	15,813.946	41.707	30.640	0.322	3.065
2010	1.163	130.151	116.846	1.003	3,232.696	18,887.583	16,794.082	39.251	30.278	0.353	5.035
2011	1.083	90.000	123.233	1.025	1,464.000	19,740.000	18,310.278	41.025	31.550	0.396	6.087
2012	1.144	119.000	128.154	1.040	2,300.000	18,975.000	17,900.000	38.450	29.900	0.435	6.899

Table A-2 (Continued)

Year	SOCPHA	SOCPPA	SOCPPA _LEAD1	SOCPYLD1	SOCPYLD2	SOCPYLE	SOCRCP	SOCRRP	SOEX	SOSPFP	SOSPHA
1985	6.550	7.270	6.580	0.000	0.000	70.919	1.930	1.155	177.988	2.213	4.890
1986	5.980	6.580	5.950	0.000	0.000	71.136	1.856	1.095	198.327	1.594	4.470
1987	5.260	5.950	5.470	0.000	0.000	71.352	2.192	1.141	231.583	1.691	3.200
1988	4.840	5.470	6.350	0.000	0.000	71.569	2.036	1.119	310.185	2.536	2.655
1989	5.705	6.350	4.970	1.000	0.000	56.639	3.951	1.124	307.069	2.172	3.710
1990	4.430	4.970	5.220	0.000	0.000	72.002	2.264	1.075	232.803	2.310	3.000
1991	4.770	5.220	5.230	1.000	0.000	57.072	3.364	1.053	291.434	2.317	3.370
1992	4.760	5.230	4.610	0.000	0.000	81.937	2.045	1.095	277.100	2.012	5.035
1993	4.220	4.610	4.800	1.000	0.000	57.505	2.594	1.082	201.568	2.364	3.205
1994	4.370	4.800	4.750	0.000	0.000	82.370	2.051	1.061	222.688	2.169	3.075
1995	4.245	4.750	6.340	1.000	0.000	57.938	1.983	1.016	197.822	2.932	2.850
1996	5.890	6.340	4.740	0.000	0.000	73.301	2.387	1.158	205.374	2.922	4.515
1997	4.300	4.740	4.400	0.000	0.000	73.517	2.217	1.100	212.083	2.334	3.827
1998	4.085	4.400	4.380	0.000	0.000	73.734	2.463	1.169	196.690	2.065	2.705
1999	4.075	4.380	4.380	0.000	0.000	73.950	2.971	1.159	255.261	1.645	3.485
2000	3.910	4.380	4.860	0.000	0.000	74.167	1.669	0.979	236.582	1.832	2.775
2001	4.395	4.860	4.600	0.000	0.000	74.383	3.309	1.015	241.815	2.021	3.160
2002	3.410	4.600	4.480	0.000	1.000	47.736	4.239	1.000	184.298	2.337	2.770
2003	3.560	4.480	4.030	0.000	1.000	47.953	5.474	1.013	198.773	2.316	3.162
2004	3.495	4.030	3.250	0.000	0.000	75.033	2.640	1.151	184.043	2.176	2.382
2005	2.960	3.250	3.400	0.000	0.000	75.249	3.037	1.075	194.315	2.147	2.187
2006	2.870	3.400	3.370	0.000	1.000	48.602	4.404	0.924	152.589	2.975	1.560
2007	3.040	3.370	3.430	0.000	0.000	75.682	2.164	1.029	276.740	3.718	2.745
2008	3.110	3.430	3.115	0.000	0.000	75.899	3.596	1.269	142.988	3.817	3.440
2009	2.840	3.115	2.715	0.000	0.000	76.115	3.093	1.102	165.792	3.342	2.320
2010	2.485	2.715	2.970	0.000	0.000	76.332	2.010	1.032	151.702	4.201	2.018
2011	2.210	2.970	2.890	0.000	1.000	49.685	4.122	1.016	63.000	5.891	1.251
2012	2.320	2.890	3.320	0.000	1.000	49.901	4.588	1.007	80.000	6.082	2.130

Table A-2 (Continued)

Year	SOSPPA	SOSPPA _LEAD1	SOSPYLD1	SOSPYLD2	SOSPYLE	SOUSFA	SOUSFE	SOUSPA _LEAD1	SOUSRFP	SOUSSE	THEXPRR
1985	5.185	4.850	0.000	0.000	57.353	26.000	663.880	15.340	3.550	1.700	15.947
1986	4.850	3.415	0.000	0.000	57.235	5.336	541.286	11.760	2.465	1.600	15.482
1987	3.415	2.870	0.000	0.000	57.117	17.542	561.073	10.340	2.973	1.300	21.627
1988	2.870	4.180	0.000	0.000	56.999	16.238	471.921	12.640	3.838	1.500	22.428
1989	4.180	3.470	0.000	0.000	56.881	18.700	508.330	10.540	3.421	1.300	21.584
1990	3.470	3.730	0.000	0.000	56.764	15.600	400.743	11.060	3.326	1.399	21.080
1991	3.730	5.325	0.000	0.000	56.646	15.300	365.836	13.180	3.409	1.690	19.745
1992	5.325	3.440	0.000	0.000	56.528	17.600	457.212	9.880	2.797	1.300	16.396
1993	3.440	3.330	0.000	0.000	56.410	18.800	440.055	9.790	3.345	1.200	19.328
1994	3.330	3.285	0.000	0.000	56.292	20.800	377.017	9.430	3.020	1.200	18.641
1995	3.285	5.175	0.000	0.000	56.175	17.400	295.083	13.100	4.431	1.600	22.826
1996	5.175	4.085	0.000	0.000	47.281	43.700	515.944	10.050	3.190	1.200	20.892
1997	4.085	4.160	0.000	0.000	55.939	53.900	364.931	9.630	2.960	1.200	18.358
1998	4.160	3.740	0.000	0.000	47.046	43.900	261.896	9.290	2.199	1.200	17.042
1999	3.740	3.615	0.000	0.000	55.703	53.900	284.647	9.200	2.049	1.149	13.639
2000	3.615	4.170	0.000	0.000	55.586	33.800	222.497	10.250	2.415	1.273	10.660
2001	4.170	3.800	0.000	1.000	48.915	21.800	230.011	9.590	2.424	1.192	10.869
2002	3.800	3.640	0.000	0.000	55.350	22.800	170.404	9.420	2.853	1.176	11.111
2003	3.640	2.620	0.000	0.000	55.232	39.000	182.013	7.490	2.878	0.915	12.039
2004	2.620	2.440	1.000	0.000	62.849	54.100	191.295	6.450	2.097	0.801	14.858
2005	2.440	2.380	0.000	0.000	54.997	49.218	139.680	6.520	2.108	0.806	15.499
2006	2.380	3.095	0.000	1.000	48.326	44.013	112.921	7.710	3.613	0.987	15.952
2007	3.095	3.930	1.000	0.000	62.496	34.100	164.892	8.280	4.354	1.055	26.687
2008	3.930	3.035	0.000	1.000	48.090	94.146	232.567	6.630	3.341	0.811	28.835
2009	3.035	2.270	0.000	1.000	47.972	89.257	140.668	5.400	3.333	0.743	25.014
2010	2.270	1.945	1.000	0.000	62.143	84.350	122.773	5.480	5.127	0.650	24.016
2011	1.945	2.650	0.000	1.000	47.737	84.300	70.000	6.240	6.100	0.700	26.898
2012	2.650	3.095	1.000	0.000	61.907	79.000	70.000	6.904	6.900	0.700	26.056

Table A-2 (Continued)

Year	USREER	WHBAFW	WHCBFP	WHCBHA	WHCBPA	WHCBPA _LEAD1	WHCBPAD1	WHCBYLE	WHCPFP	WHCPHA	WHCPPA _LEAD1
1985	111.000	0.577	2.947	3.792	4.240	4.490	0.000	48.381	2.833	17.222	17.160
1986	108.000	0.697	2.360	3.200	4.490	3.740	0.000	48.845	2.249	15.155	16.060
1987	105.000	0.612	2.528	3.200	3.740	4.850	0.000	49.308	2.448	14.405	15.054
1988	96.000	0.539	3.530	4.455	4.850	6.100	0.000	49.772	3.610	13.852	17.725
1989	95.000	0.616	3.770	5.810	6.100	6.630	0.000	50.235	3.727	13.220	17.592
1990	96.000	0.817	2.737	6.165	6.630	5.375	0.000	50.698	2.506	16.640	16.788
1991	96.000	0.674	2.644	4.750	5.375	5.050	0.000	36.726	2.875	15.436	17.050
1992	94.000	0.652	3.173	4.155	5.050	5.130	0.000	51.625	3.135	14.947	17.285
1993	93.000	0.722	2.797	4.655	5.130	4.335	0.000	52.089	3.040	15.783	17.045
1994	94.000	0.556	3.070	3.875	4.335	4.810	0.000	52.552	3.349	16.092	16.790
1995	94.000	0.604	3.915	4.525	4.810	5.552	0.000	53.015	4.596	15.838	16.970
1996	94.000	0.609	4.056	4.440	5.552	4.207	0.000	39.043	4.497	13.168	16.453
1997	96.000	0.641	3.140	3.915	4.207	4.540	0.000	53.942	3.166	15.550	15.412
1998	104.000	0.571	2.314	4.292	4.540	3.670	0.000	54.406	2.524	14.510	14.553
1999	103.000	0.733	2.079	3.501	3.670	3.690	0.000	61.125	2.239	13.350	14.098
2000	105.000	0.792	2.111	3.508	3.690	3.025	0.000	61.589	2.651	13.446	13.947
2001	110.000	0.593	2.451	2.778	3.025	2.780	0.000	55.796	2.702	11.844	13.725
2002	111.000	0.651	3.092	2.526	2.780	3.355	0.000	56.259	3.460	11.390	15.030
2003	107.000	0.674	3.171	3.131	3.355	3.368	0.000	64.335	3.181	14.049	14.165
2004	103.000	0.733	3.200	3.184	3.368	2.460	0.000	57.186	3.247	11.864	14.420
2005	100.000	0.836	3.214	2.325	2.460	3.415	0.000	65.262	3.331	13.479	13.770
2006	99.000	0.665	3.414	3.258	3.415	3.325	0.000	58.113	4.561	12.719	14.970
2007	96.000	0.589	5.297	2.898	3.325	4.190	0.000	58.576	5.931	12.929	13.540
2008	92.000	0.871	5.749	3.995	4.190	3.138	1.000	59.040	6.866	12.506	13.630
2009	95.000	1.112	4.268	3.002	3.138	1.745	1.000	59.503	4.741	12.879	12.478
2010	90.000	0.691	5.216	1.565	1.745	2.922	0.000	59.966	5.239	11.867	12.665
2011	87.000	0.788	6.538	2.711	2.922	2.318	1.000	60.430	6.963	11.394	13.243
2012	88.000	0.787	7.353	2.098	2.318	3.166	0.000	60.893	7.675	12.582	13.069

Table A-2 (Continued)

Year	WHCPYLE	WHCRDS	WHCRNP	WHCRRP	WHCRSP	WHDSFP	WHDSHA	WHDSPA	WHDSPA _LEAD1	WHDSPAD 1	WHDSYLD 1
1985	34.525	1.488	0.687	0.724	3.618	3.153	1.080	1.280	1.375	0.000	0.000
1986	34.718	0.929	-0.136	0.620	3.794	2.572	1.225	1.375	1.570	0.000	0.000
1987	34.911	1.248	0.917	0.755	4.520	2.605	1.360	1.570	1.920	0.000	0.000
1988	35.103	1.132	1.211	0.683	3.085	3.448	1.790	1.920	2.215	0.000	0.000
1989	27.699	1.252	0.894	0.634	2.612	3.734	2.000	2.215	2.540	0.000	0.000
1990	35.488	1.740	1.283	0.874	5.586	3.132	2.310	2.540	1.750	0.000	0.000
1991	35.681	21.952	1.274	0.790	5.210	2.764	1.370	1.750	1.450	0.000	0.000
1992	35.874	1.081	0.425	0.639	3.076	3.484	1.270	1.450	1.530	0.000	0.000
1993	36.066	1.902	0.288	0.767	4.691	2.854	1.345	1.530	1.260	0.000	0.000
1994	36.259	1.383	1.395	0.655	7.284	3.213	1.110	1.260	1.380	0.000	0.000
1995	28.854	1.773	0.898	0.712	5.571	3.703	1.245	1.380	1.685	0.000	0.000
1996	29.047	1.278	1.045	0.630	4.310	4.365	1.600	1.685	1.210	0.000	1.000
1997	44.905	1.595	1.072	0.719	7.024	3.444	1.110	1.210	1.240	0.000	0.000
1998	45.097	0.193	1.075	0.732	2.924	2.691	1.140	1.240	1.260	0.000	0.000
1999	45.290	1.038	0.391	0.734	4.300	2.262	1.190	1.260	1.630	0.000	1.000
2000	37.414	0.695	0.430	0.706	4.520	2.386	1.520	1.630	1.525	0.000	1.000
2001	37.607	1.714	1.115	0.709	5.293	2.419	1.355	1.525	1.410	0.000	0.000
2002	30.761	1.694	2.202	0.652	3.106	2.890	1.230	1.410	1.005	0.000	0.000
2003	46.060	1.517	1.753	0.712	3.561	3.151	0.835	1.005	1.010	0.000	0.000
2004	38.185	1.346	1.227	0.606	4.212	3.457	0.920	1.010	0.400	1.000	0.000
2005	38.377	1.257	1.157	0.585	3.167	3.281	0.325	0.400	0.565	0.000	0.000
2006	31.531	1.677	1.787	0.714	6.158	3.536	0.483	0.565	1.425	0.000	0.000
2007	38.763	2.331	1.630	0.648	2.057	4.685	1.250	1.425	1.990	0.000	0.000
2008	38.955	1.816	1.327	0.599	2.637	5.658	1.850	1.990	0.795	1.000	0.000
2009	39.148	1.516	1.628	0.729	11.643	4.731	0.730	0.795	0.450	1.000	0.000
2010	39.340	2.121	2.620	0.909	3.152	4.978	0.360	0.450	1.220	0.000	0.000
2011	39.533	1.931	2.478	0.856	4.327	7.235	1.090	1.220	1.205	0.000	0.000
2012	39.726	3.179	2.102	0.891	4.065	6.904	1.070	1.205	1.380	0.000	0.000

Table A-2 (Continued)

Year	WHDSYLE	WHEX	WHEXD1	WHFWFP	WHFWHA	WHFWPA	WHFWPA _LEAD1	WHFWYLD1	WHFWYLE	WHLSFP	WHLSHA
1985	35.624	909.000	0.000	3.351	6.331	6.790	6.193	0.000	55.956	2.956	3.590
1986	36.400	999.000	0.000	2.577	5.796	6.193	5.102	0.000	56.457	2.413	3.642
1987	37.176	1,588.000	1.000	2.768	4.841	5.102	5.073	1.000	63.746	2.569	3.007
1988	49.428	1,415.000	1.000	4.088	4.795	5.073	6.569	1.000	64.247	3.696	3.003
1989	38.727	1,232.000	0.000	3.889	5.545	6.569	6.011	0.000	57.960	3.622	3.519
1990	39.503	1,069.000	0.000	2.774	5.725	6.011	6.669	1.000	65.249	2.498	3.807
1991	20.991	1,282.000	1.000	3.596	4.827	6.669	6.074	0.000	58.962	3.081	2.842
1992	41.055	1,354.000	1.000	3.638	5.630	6.074	6.224	0.000	59.463	3.147	3.501
1993	41.831	1,228.000	0.000	3.140	5.919	6.224	6.086	1.000	66.752	3.204	2.963
1994	42.606	1,188.000	0.000	3.775	5.755	6.086	6.049	1.000	67.254	3.291	3.267
1995	43.382	1,241.000	0.000	4.660	5.630	6.049	6.543	1.000	67.755	4.445	3.008
1996	51.786	1,002.000	0.000	4.231	6.295	6.543	6.116	1.000	68.256	4.180	3.282
1997	44.934	1,040.000	0.000	3.416	5.795	6.116	5.958	1.000	68.757	3.416	3.087
1998	45.710	1,046.000	0.000	2.708	5.624	5.958	5.684	1.000	69.258	2.824	2.694
1999	54.114	1,086.000	0.000	2.765	5.148	5.684	5.668	0.000	62.971	2.574	2.667
2000	54.889	1,062.000	0.000	2.694	5.370	5.668	5.464	0.000	63.472	2.624	2.614
2001	48.037	962.000	0.000	3.229	5.043	5.464	5.437	0.000	58.304	2.750	2.492
2002	48.813	850.000	0.000	3.774	4.924	5.437	5.883	0.000	58.805	3.602	2.466
2003	49.589	1,158.000	0.000	3.703	5.343	5.883	5.492	0.000	64.975	3.513	2.665
2004	50.364	1,066.000	0.000	3.670	5.054	5.492	5.312	0.000	65.476	3.176	2.507
2005	51.140	1,003.000	0.000	3.353	4.911	5.312	5.171	0.000	65.978	3.423	2.517
2006	51.916	908.000	0.000	4.370	4.792	5.171	5.158	0.000	66.479	4.037	2.585
2007	52.692	1,263.000	0.000	7.163	4.723	5.158	5.820	0.000	66.980	6.423	2.518
2008	53.468	1,015.000	0.000	6.593	5.380	5.820	5.591	0.000	67.481	6.465	2.937
2009	54.243	879.000	0.000	5.096	5.141	5.591	5.718	0.000	67.982	4.499	2.480
2010	55.019	1,289.000	0.000	6.119	5.260	5.718	5.892	0.000	68.483	5.910	2.350
2011	55.795	1,010.000	0.000	6.898	5.504	5.892	5.454	0.000	77.032	7.271	2.541
2012	56.571	975.000	0.000	8.318	5.013	5.454	5.372	0.000	69.485	8.312	2.132

Table A-2 (Continued)

Year	WHLSPA	WHLSPA _LEAD1	WHLSPAD1	WHLSYLD1	WHLSYLE	WHNEHA	WHNEPA _LEAD1	WHNEYLE	WHNPFP	WHNPHA	WHNPPA
1985	3.775	3.875	0.000	0.000	50.073	0.576	0.646	46.725	3.276	16.833	19.491
1986	3.875	3.145	0.000	0.000	36.365	0.593	0.543	47.292	2.506	18.237	19.019
1987	3.145	3.320	1.000	0.000	37.243	0.511	0.561	47.859	2.814	17.611	18.154
1988	3.320	3.637	1.000	1.000	28.226	0.533	0.724	48.426	3.948	13.906	17.871
1989	3.637	3.935	1.000	0.000	38.997	0.681	0.681	48.993	3.542	19.289	21.305
1990	3.935	2.909	0.000	0.000	54.460	0.646	0.618	49.560	2.503	20.095	21.467
1991	2.909	3.677	1.000	0.000	40.753	0.583	0.666	50.127	3.090	17.590	18.732
1992	3.677	3.484	0.000	0.000	41.630	0.624	0.597	50.694	3.215	20.394	21.772
1993	3.484	3.408	0.000	1.000	32.613	0.557	0.655	51.261	3.695	19.815	21.373
1994	3.408	3.083	0.000	1.000	33.491	0.612	0.671	51.828	3.608	20.169	21.075
1995	3.083	3.437	0.000	0.000	44.263	0.647	0.730	52.395	4.802	19.525	20.128
1996	3.437	3.213	0.000	0.000	45.140	0.694	0.658	52.962	4.154	22.965	23.905
1997	3.213	2.763	0.000	0.000	46.017	0.635	0.694	53.529	3.648	20.596	22.055
1998	2.763	2.738	0.000	0.000	46.895	0.660	0.668	54.096	2.959	18.394	19.079
1999	2.738	2.701	0.000	0.000	47.773	0.625	0.688	54.663	2.736	17.194	18.285
2000	2.701	2.565	0.000	0.000	48.650	0.642	0.588	55.230	2.774	17.389	18.721
2001	2.565	2.698	0.000	0.000	49.527	0.547	0.600	55.797	2.858	15.465	18.003
2002	2.698	2.769	0.000	0.000	50.405	0.565	0.563	56.364	3.876	14.516	18.059
2003	2.769	2.635	0.000	0.000	61.025	0.510	0.491	56.931	3.608	16.648	17.316
2004	2.635	2.628	0.000	0.000	52.160	0.456	0.492	57.498	3.448	15.739	17.095
2005	2.628	2.671	0.000	0.000	53.037	0.459	0.556	58.065	3.589	17.415	17.914
2006	2.671	2.614	0.000	0.000	53.915	0.443	0.586	58.632	4.497	16.222	17.568
2007	2.614	3.028	0.000	0.000	54.793	0.489	0.706	59.199	7.282	16.927	17.419
2008	3.028	2.620	0.000	0.000	55.670	0.607	0.648	59.766	7.142	17.676	18.794
2009	2.620	2.435	0.000	0.000	56.547	0.576	0.540	60.333	4.969	16.861	17.564
2010	2.435	2.625	0.000	0.000	57.425	0.458	0.690	60.900	6.473	16.480	16.950
2011	2.625	2.225	0.000	0.000	58.303	0.565	0.701	61.467	7.914	14.512	14.958
2012	2.225	2.190	0.000	0.000	59.180	0.551	0.775	62.034	8.445	15.700	16.165

Table A-2 (Continued)

Year	WHNPPA _LEAD1	WHNPPAD1	WHNPYLE	WHPESE	WHSBCB	WHSBLS	WHSEFP	WHSEHA	WHSEPA	WHSEPA _LEAD1	WHSEPAD1
1985	19.019	0.000	27.461	6.959	1.363	1.218	2.911	3.360	3.940	3.020	0.000
1986	18.154	0.000	27.860	11.885	1.865	2.842	2.495	2.380	3.020	2.855	0.000
1987	17.871	0.000	28.259	10.098	2.173	3.218	2.532	2.290	2.855	3.060	0.000
1988	21.305	1.000	14.847	3.838	1.193	2.349	3.402	2.565	3.060	3.790	0.000
1989	21.467	0.000	29.057	5.607	1.100	1.501	3.569	3.225	3.790	3.565	0.000
1990	18.732	0.000	34.502	5.378	1.814	1.619	2.999	3.015	3.565	2.890	0.000
1991	21.772	1.000	29.855	7.669	3.352	1.752	2.669	2.285	2.890	2.730	0.000
1992	21.373	0.000	35.300	4.683	1.364	1.702	3.220	2.210	2.730	2.835	0.000
1993	21.075	0.000	30.653	5.206	2.022	1.938	2.767	2.305	2.835	3.015	0.000
1994	20.128	0.000	31.052	4.867	1.471	2.561	3.035	2.460	3.015	3.060	0.000
1995	23.905	1.000	31.451	5.223	1.425	1.330	3.710	2.387	3.060	3.013	0.000
1996	22.055	0.000	31.850	3.781	2.589	1.667	4.303	2.465	3.013	3.070	0.000
1997	19.079	0.000	32.249	6.377	1.924	1.856	3.199	2.467	3.070	3.020	0.000
1998	18.285	0.000	32.648	8.401	1.869	1.436	2.485	2.423	3.020	2.761	0.000
1999	18.721	0.000	33.047	5.886	1.628	1.518	2.251	2.118	2.761	2.783	0.000
2000	18.003	0.000	33.446	6.239	1.633	1.458	2.302	1.999	2.783	2.615	0.000
2001	18.059	0.000	33.845	6.797	1.684	1.331	2.388	1.809	2.615	2.529	0.000
2002	17.316	0.000	25.764	1.392	1.381	1.118	2.820	1.657	2.529	2.420	0.000
2003	17.095	0.000	34.643	2.342	1.297	1.041	3.061	1.692	2.420	2.398	0.000
2004	17.914	0.000	35.042	2.550	1.462	1.070	3.171	1.745	2.398	1.938	1.000
2005	17.568	0.000	35.441	2.082	1.218	1.444	3.109	1.403	1.938	1.928	1.000
2006	17.419	0.000	35.840	1.847	1.716	1.330	3.383	1.378	1.928	2.373	0.000
2007	18.794	0.000	36.239	1.616	1.641	1.168	5.338	1.665	2.373	3.295	0.000
2008	17.564	0.000	36.638	0.997	1.562	1.201	5.799	2.808	3.295	2.632	1.000
2009	16.950	0.000	37.037	1.462	2.162	1.767	4.430	2.134	2.632	1.807	1.000
2010	14.958	0.000	37.436	1.666	1.892	1.344	5.206	1.339	1.807	2.602	0.000
2011	16.165	0.000	37.835	1.509	1.491	1.119	6.905	2.193	2.602	2.875	0.000
2012	15.213	0.000	38.234	2.645	1.399	1.269	6.901	2.455	2.875	3.535	0.000

Table A-2 (Continued)

Year	WHSMRP	WHSORP	WHSPFP	WHSPHA	WHSPPA	WHSPPA _LEAD1	WHSPYLD1	WHSPYLE	WHUSFA	WHUSFA _LAG1	WHUSPA _LEAD1
1985	0.054	0.627	2.940	11.920	16.630	16.220	0.000	28.578	674.000	651.000	72.000
1986	0.073	0.566	2.296	10.460	16.220	14.660	0.000	28.773	712.000	674.000	65.830
1987	0.093	0.661	2.410	8.720	14.660	13.820	0.000	28.968	721.000	712.000	65.530
1988	0.068	0.610	3.507	8.290	13.820	14.550	0.000	29.164	726.000	721.000	76.620
1989	0.050	0.565	3.788	8.900	14.550	14.620	0.000	29.359	749.000	726.000	77.040
1990	0.069	0.812	2.641	10.700	14.620	14.150	0.000	29.555	790.000	749.000	69.880
1991	0.063	0.750	2.791	8.120	14.150	13.750	0.000	29.750	789.000	790.000	72.220
1992	0.060	0.583	3.183	10.030	13.750	13.710	0.000	29.945	835.000	789.000	72.170
1993	0.059	0.709	2.903	9.370	13.710	13.470	0.000	30.141	872.000	835.000	70.350
1994	0.047	0.617	3.343	8.430	13.470	13.060	1.000	23.621	853.000	872.000	69.030
1995	0.052	0.701	4.323	8.150	13.060	13.270	0.000	23.817	883.000	853.000	75.110
1996	0.063	0.544	4.848	7.910	13.270	13.430	1.000	24.012	891.000	883.000	70.410
1997	0.055	0.654	3.227	9.685	13.430	13.115	0.000	30.922	914.000	891.000	65.820
1998	0.052	0.626	2.608	9.265	13.115	13.045	0.000	36.190	910.000	914.000	62.660
1999	0.068	0.633	2.263	7.980	13.045	12.570	0.000	36.386	929.000	910.000	62.550
2000	0.066	0.721	2.557	6.575	12.570	11.700	0.000	31.509	950.000	929.000	59.430
2001	0.060	0.698	2.759	7.140	11.700	13.080	0.000	31.704	926.000	950.000	60.320
2002	0.051	0.652	3.224	6.550	13.080	13.800	0.000	31.899	919.000	926.000	62.140
2003	0.075	0.703	3.224	8.190	13.800	12.990	0.000	32.095	912.000	919.000	59.640
2004	0.054	0.526	3.323	8.500	12.990	11.650	0.000	32.290	910.000	912.000	57.210
2005	0.051	0.544	3.404	7.270	11.650	11.690	0.000	32.486	917.000	910.000	57.330
2006	0.048	0.772	4.630	4.920	11.690	12.590	1.000	23.131	938.000	917.000	60.460
2007	0.052	0.630	6.298	7.600	12.590	11.830	0.000	32.876	948.000	938.000	63.190
2008	0.049	0.472	7.181	7.940	11.830	12.550	0.000	33.072	927.000	948.000	59.170
2009	0.064	0.661	5.047	6.090	12.550	11.470	1.000	23.717	919.000	927.000	53.590
2010	0.061	0.881	5.143	7.940	11.470	10.835	0.000	33.463	926.000	919.000	54.410
2011	0.055	0.843	7.364	5.195	10.835	11.550	1.000	24.108	945.000	926.000	55.736
2012	0.056	0.885	7.296	7.390	11.550	11.830	0.000	33.853	958.000	945.000	56.530

Table A-2 (Continued)

Year	WHUSRE	WHUSRFP	WHUSRP	WHUSSE
1985	284.000	5.665	0.909	93.000
1986	401.000	4.355	0.786	84.000
1987	290.000	4.495	1.062	85.000
1988	150.000	6.290	1.447	103.000
1989	139.000	6.061	1.000	104.000
1990	482.000	4.094	0.702	93.000
1991	244.000	4.545	1.149	98.000
1992	194.000	4.795	1.080	99.000
1993	272.000	4.720	1.006	96.000
1994	345.000	4.892	1.058	89.000
1995	154.000	6.320	1.319	103.000
1996	308.000	5.862	0.945	102.000
1997	251.000	4.528	0.786	92.000
1998	391.000	3.510	0.784	80.000
1999	279.000	3.237	0.936	92.000
2000	300.000	3.348	1.056	79.000
2001	182.000	3.473	1.061	83.000
2002	116.000	4.377	1.281	84.000
2003	203.000	4.094	0.955	80.000
2004	181.000	3.982	1.000	78.000
2005	157.000	3.877	1.006	77.000
2006	117.000	4.678	1.246	82.000
2007	16.000	6.915	1.521	88.000
2008	255.000	7.078	1.046	78.000
2009	150.000	5.040	0.718	69.000
2010	132.000	5.822	1.170	71.000
2011	163.000	7.240	1.270	76.000
2012	360.000	7.800	1.077	74.000

APPENDIX B

FIGURES

Figure B-1. Theoretical Impacts of the U.S. Currency Depreciation

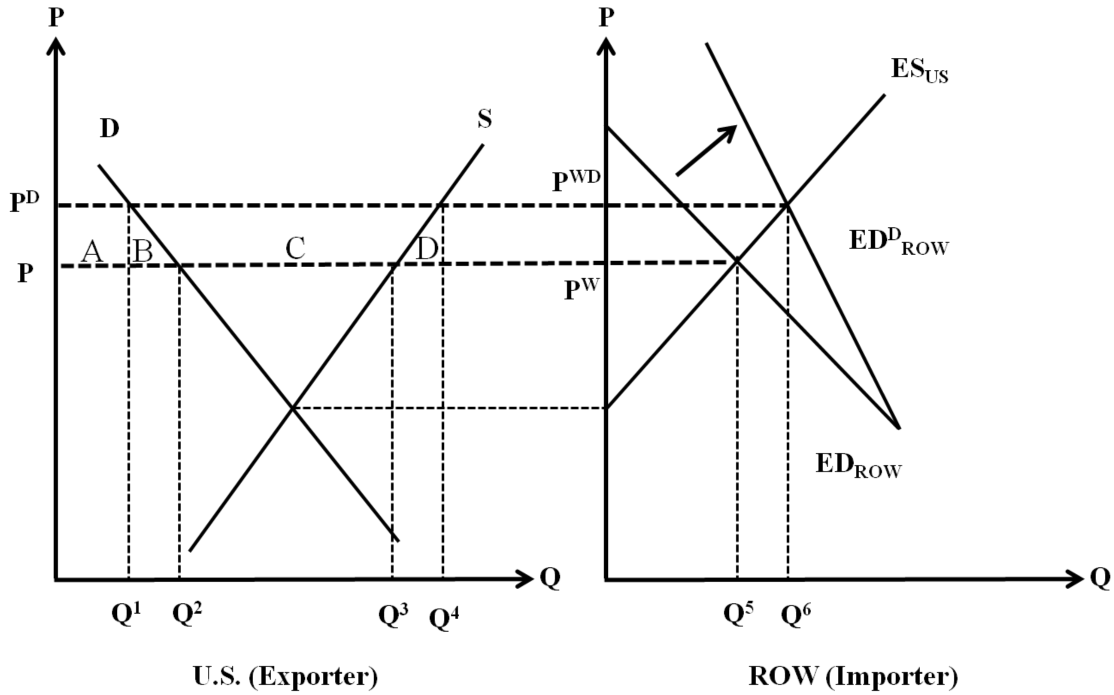


Figure B-2. Theoretical Impacts of the U.S. Currency Appreciation

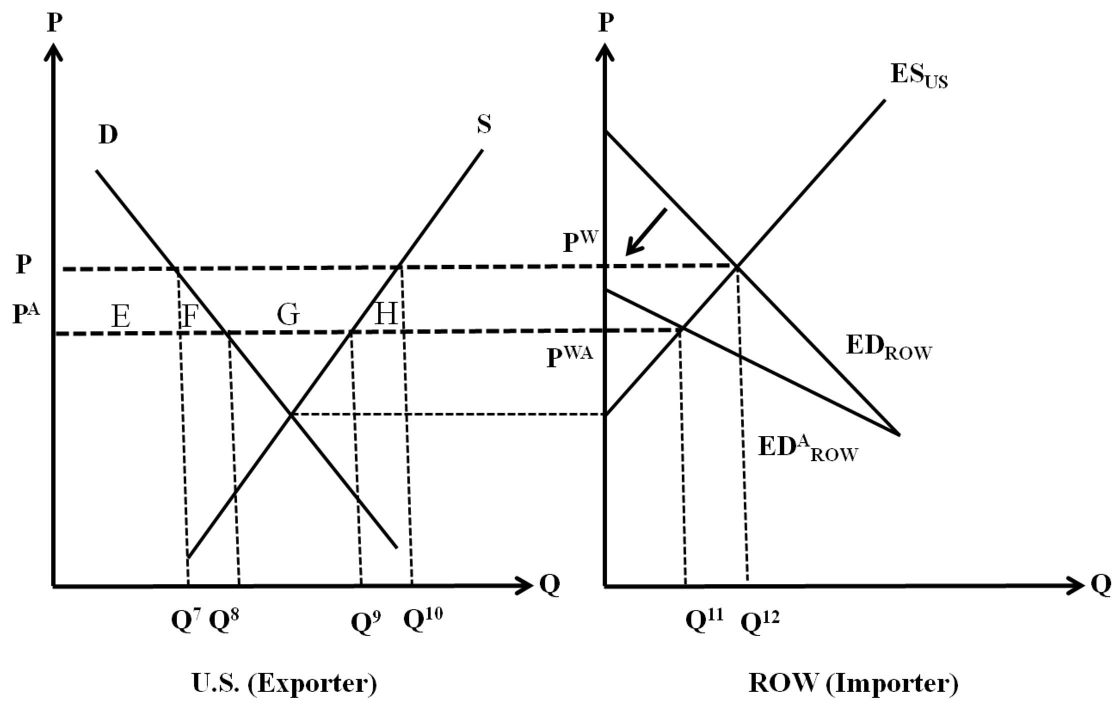


Figure B-3. Theoretical Impacts of the RFS2 on the Corn-Ethanol Markets

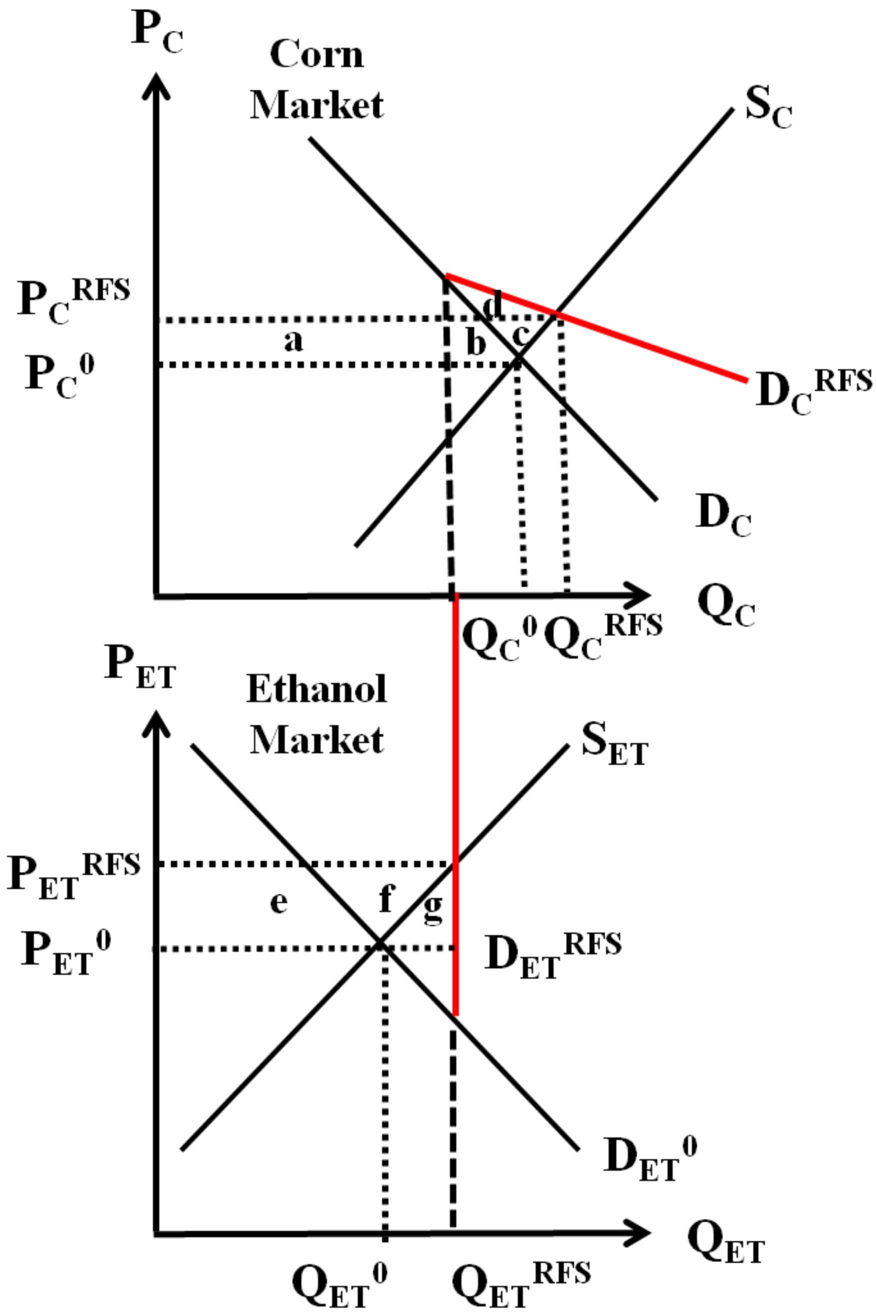


Figure B-4. Theoretical Impacts of the RFS2 on the Soybean-SB Oil-Biodiesel Markets

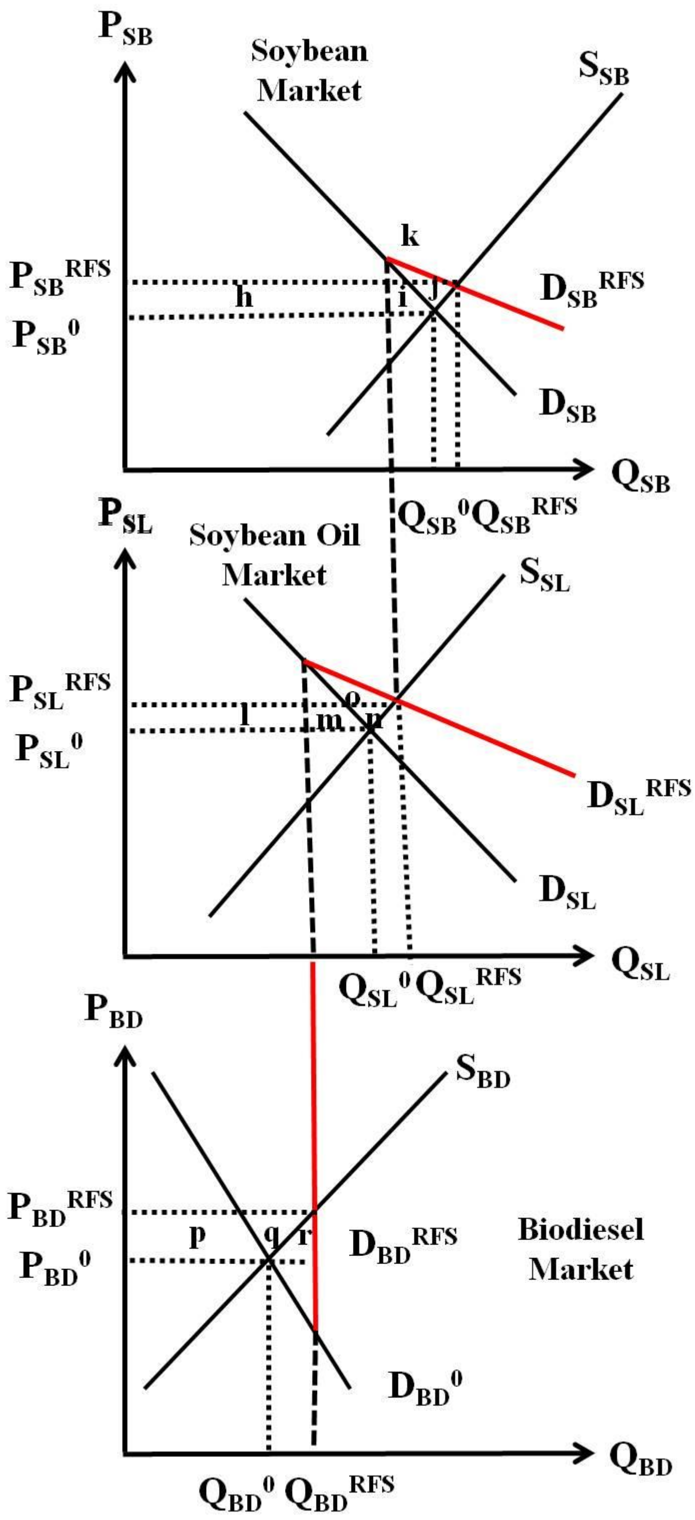


Figure B-5. Theoretical Impacts of the 2014 Farm Bill on the Planting Decisions

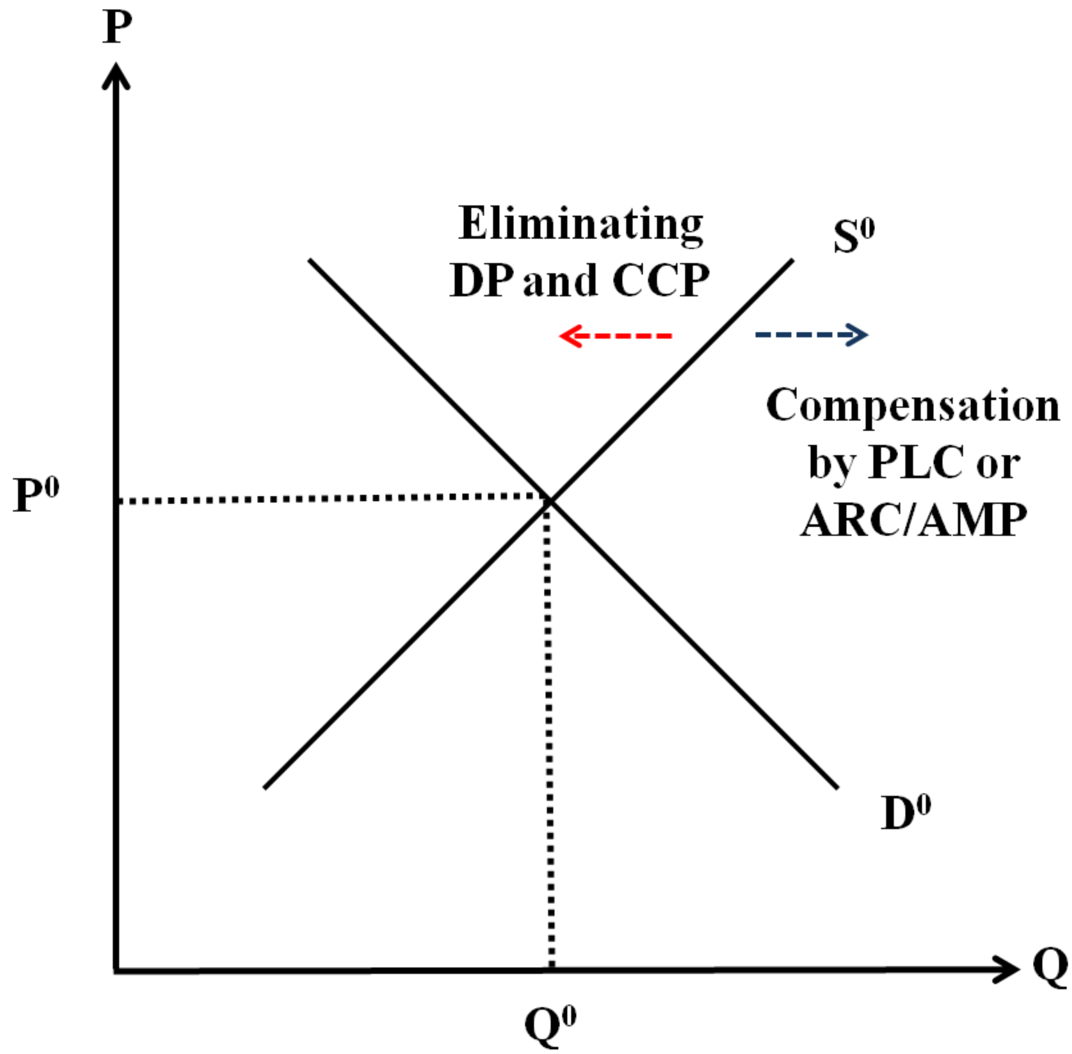


Figure B-6. Corn Planted Acres by Region

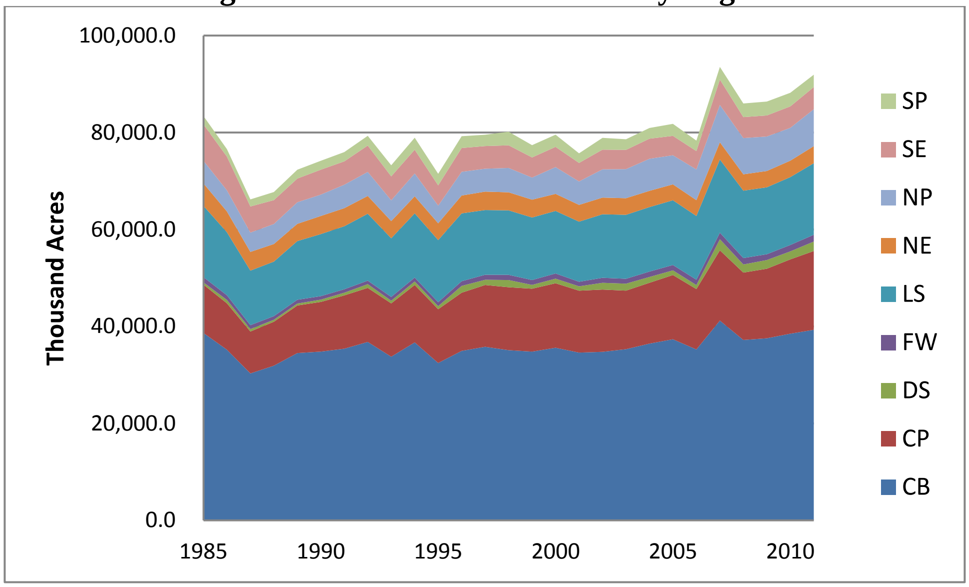


Figure B-7. Barley Planted Acres by Region

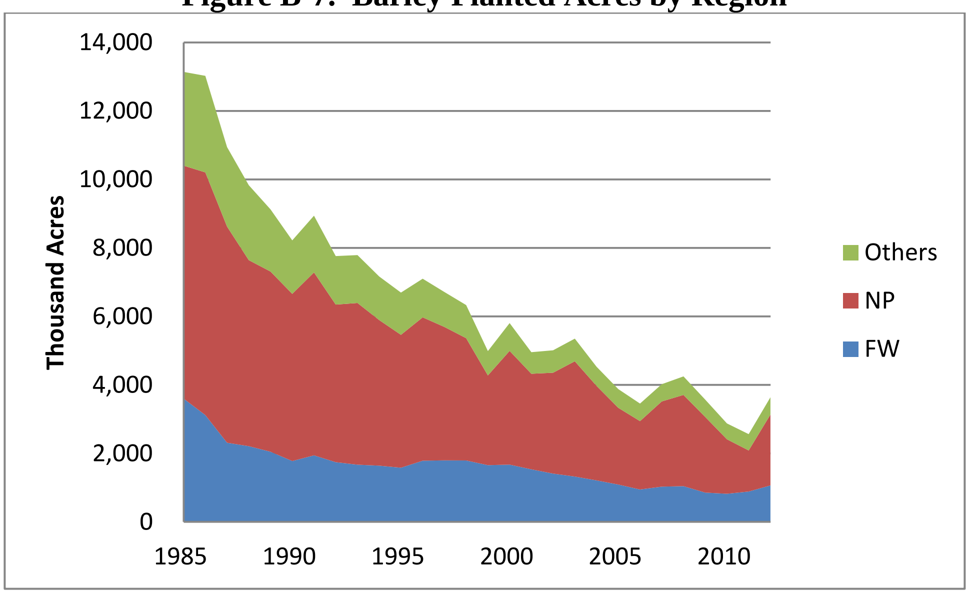


Figure B-8. Cotton Planted Acres by Region

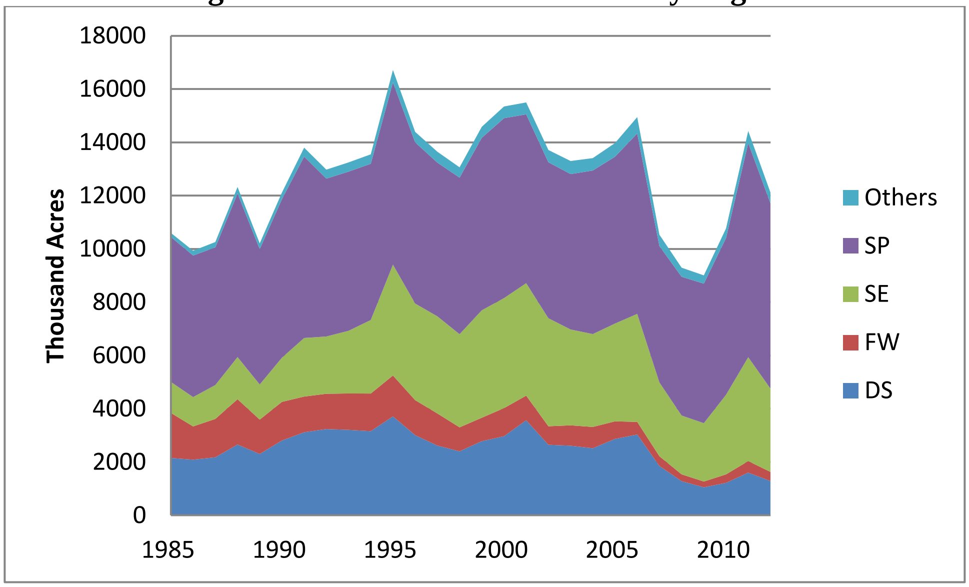


Figure B-9. Cotton Planted Acres and Harvested Acres in Southern Plains

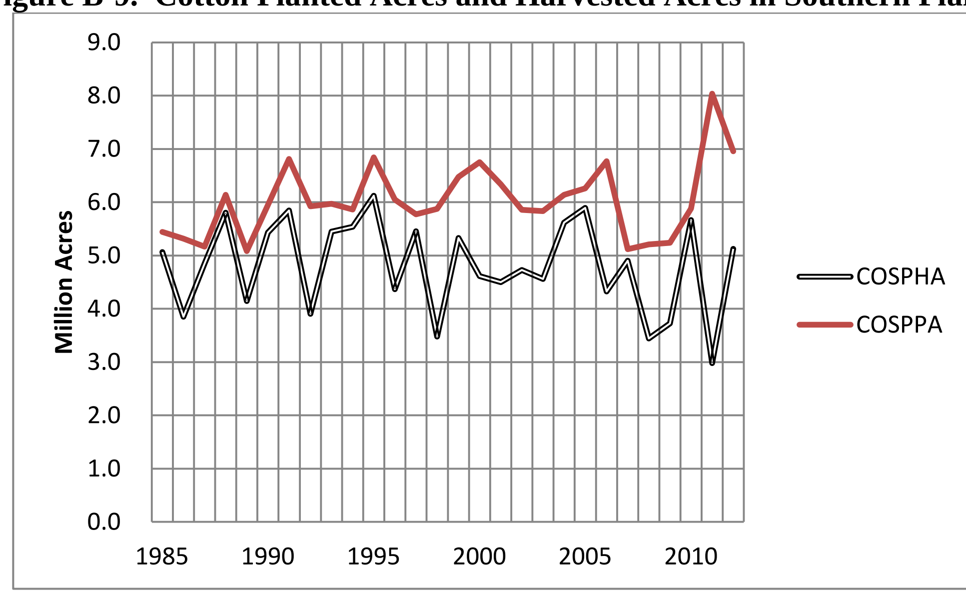


Figure B-10. U.S Upland Cotton Domestic Use and Exports, 1985-2012

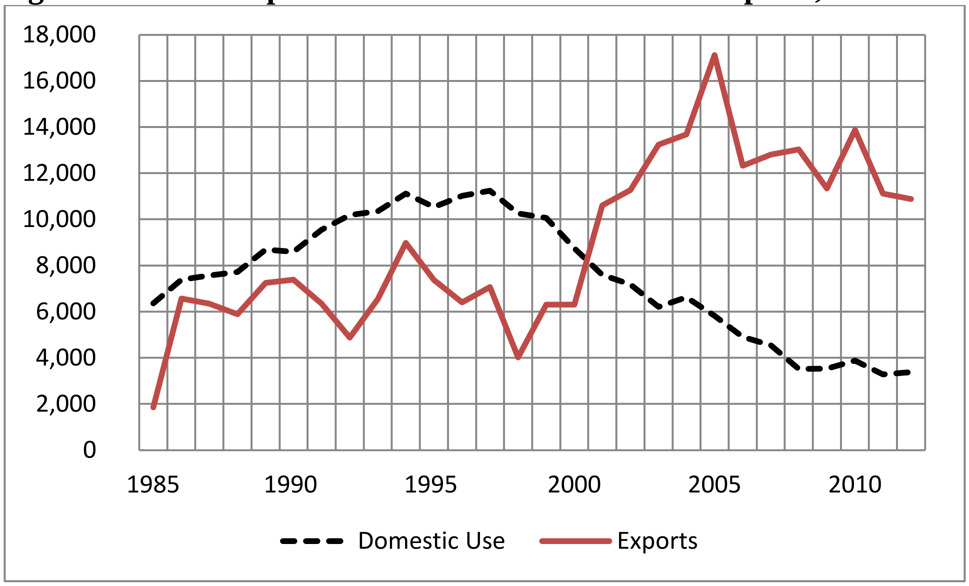


Figure B-11. Oat planted Acres by Region

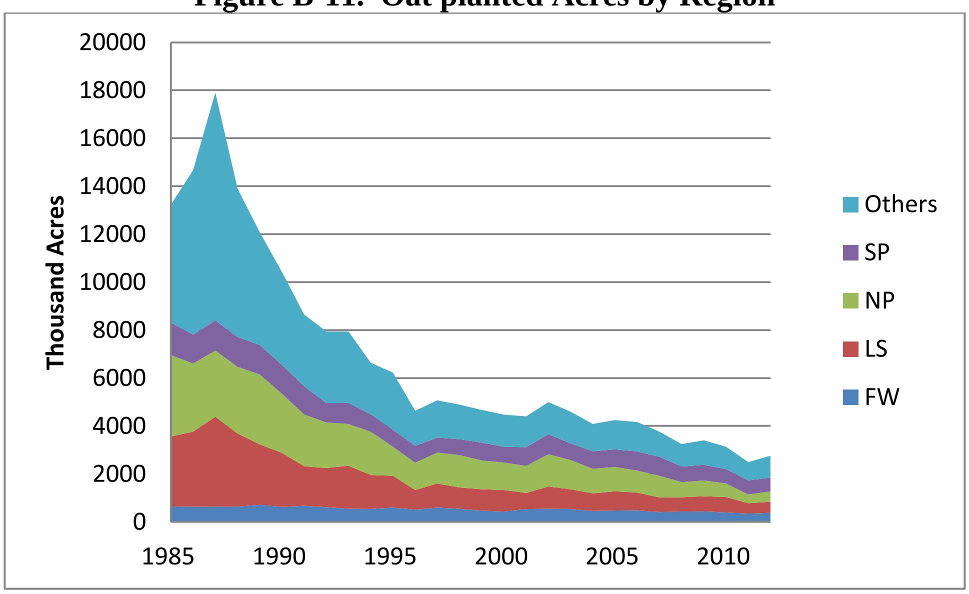


Figure B-12. LG Rice Planted Acres by Region

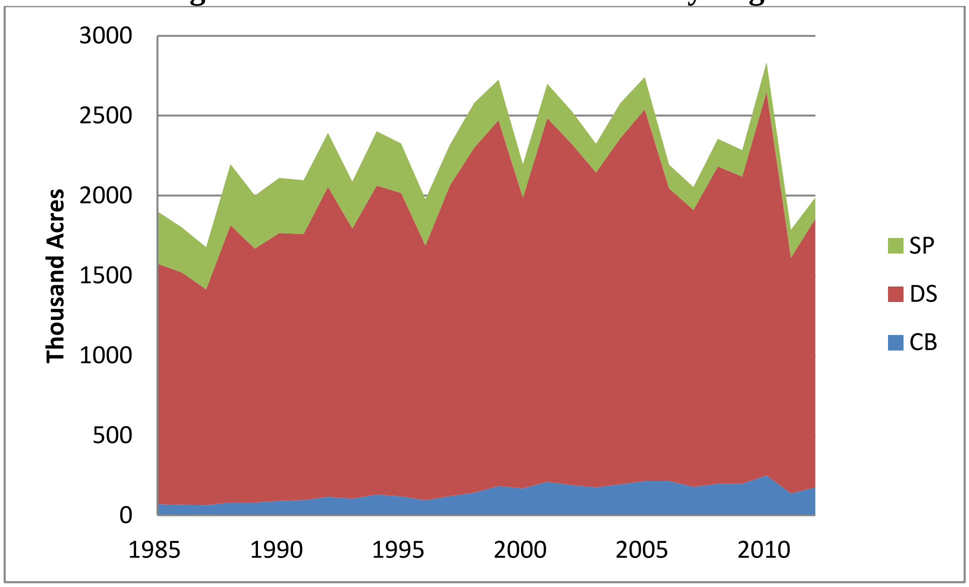


Figure B-13. MSG Rice Planted Acres by Region

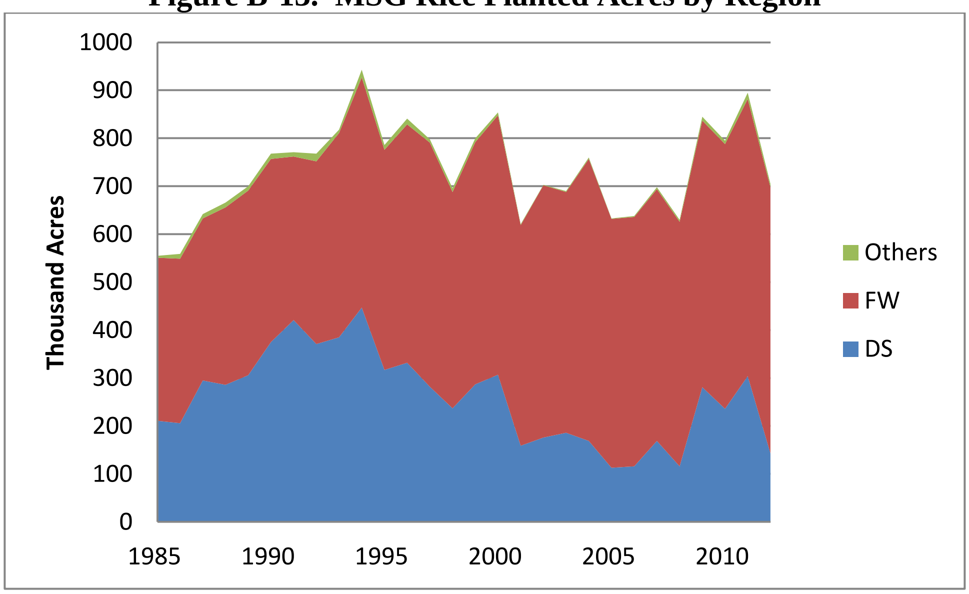


Figure B-14. Sorghum Planted Acres by Region

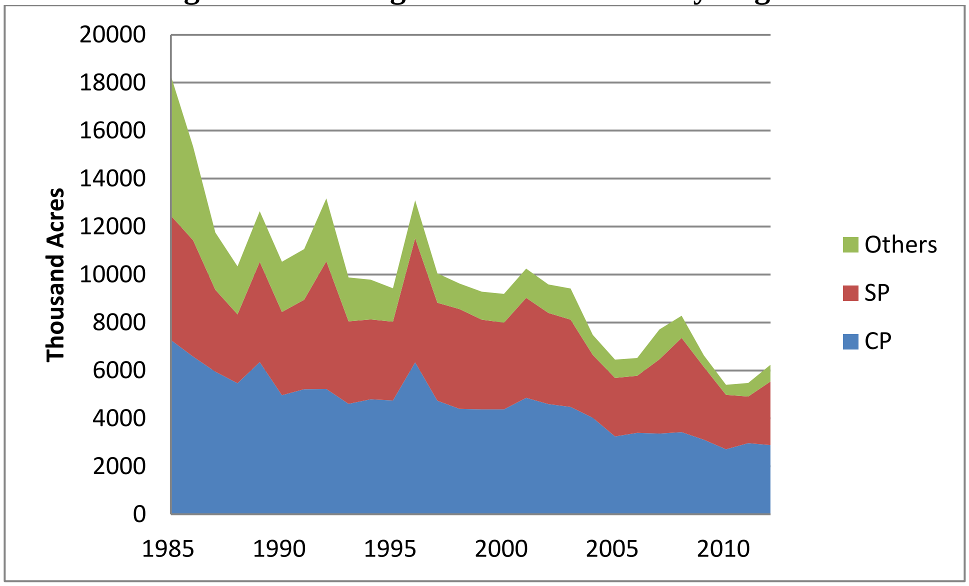


Figure B-15. Soybeans Planted Acres by Region

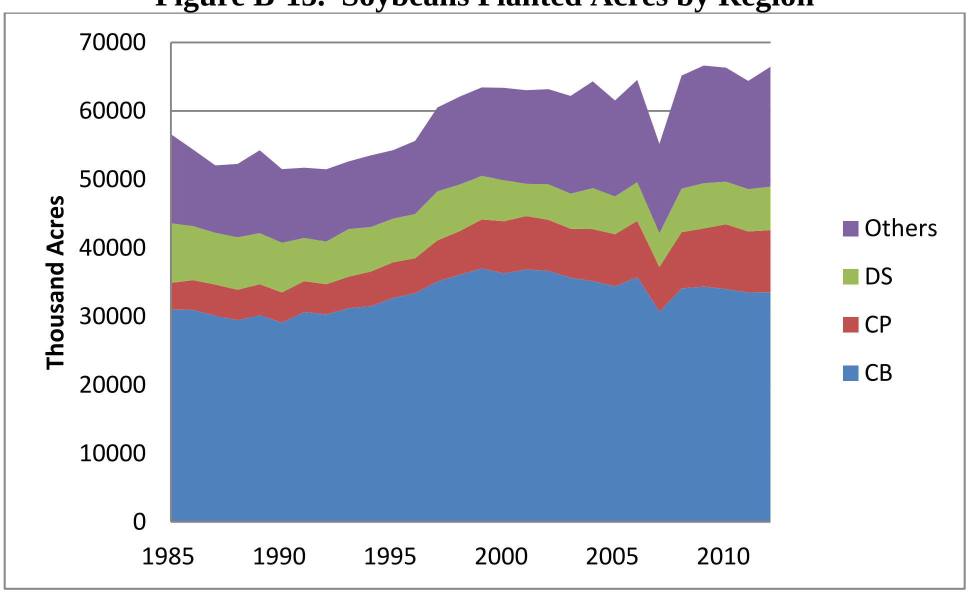


Figure B-16. Wheat Planted Acres by Region

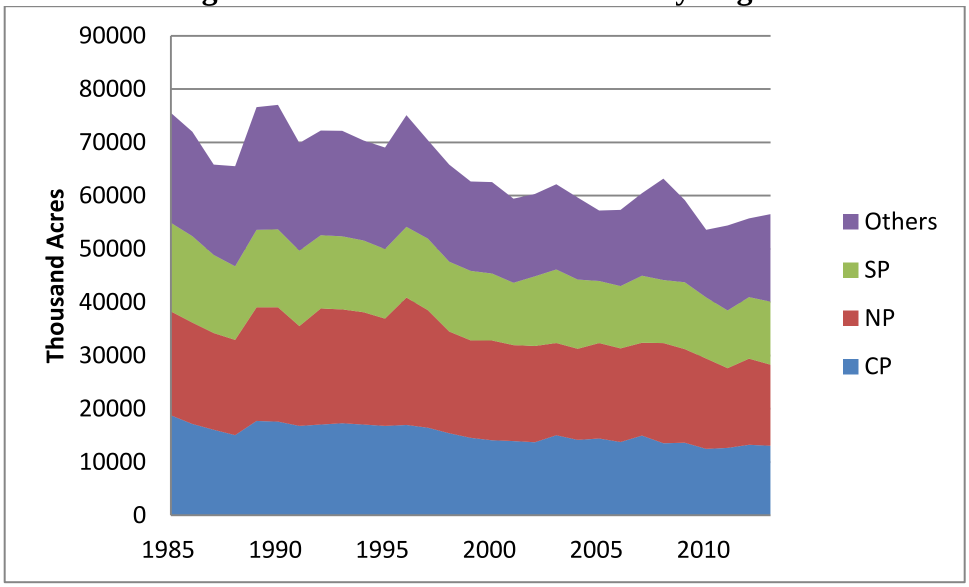


Figure B-17. Peanut Average Price Received by Farmers

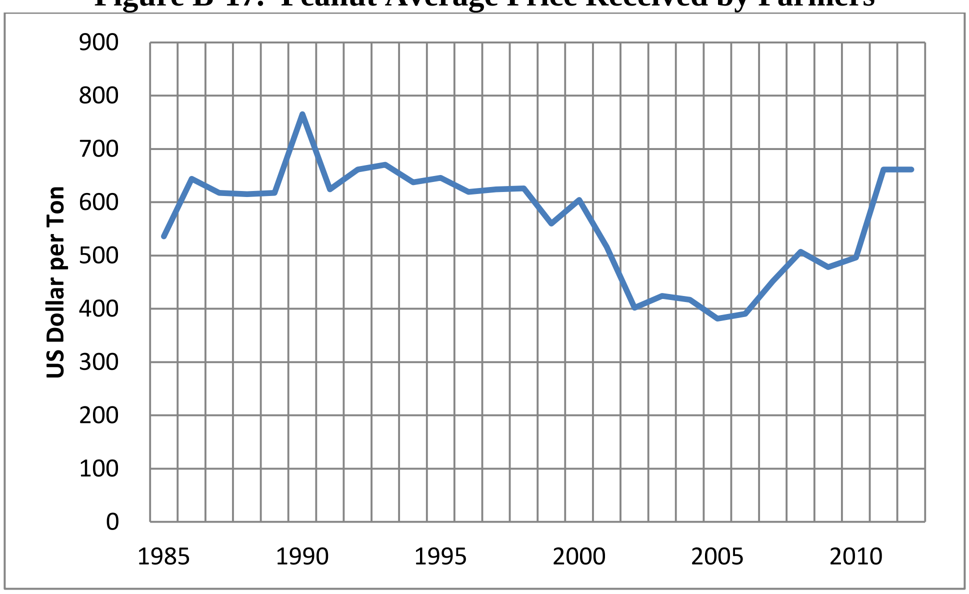


Figure B-18. Peanut Planted Acres by Region

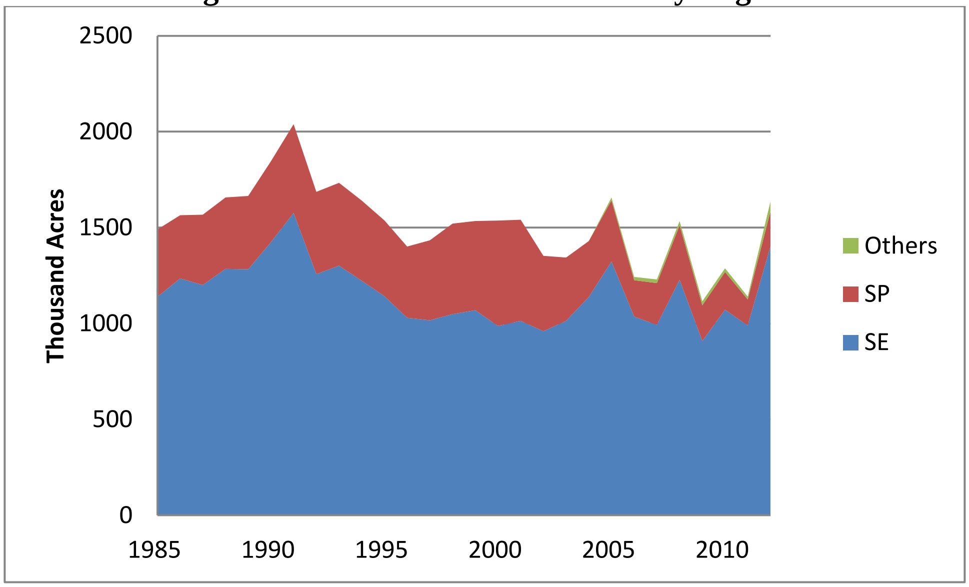


Figure B-19. Forecast Results for the U.S. Corn Price

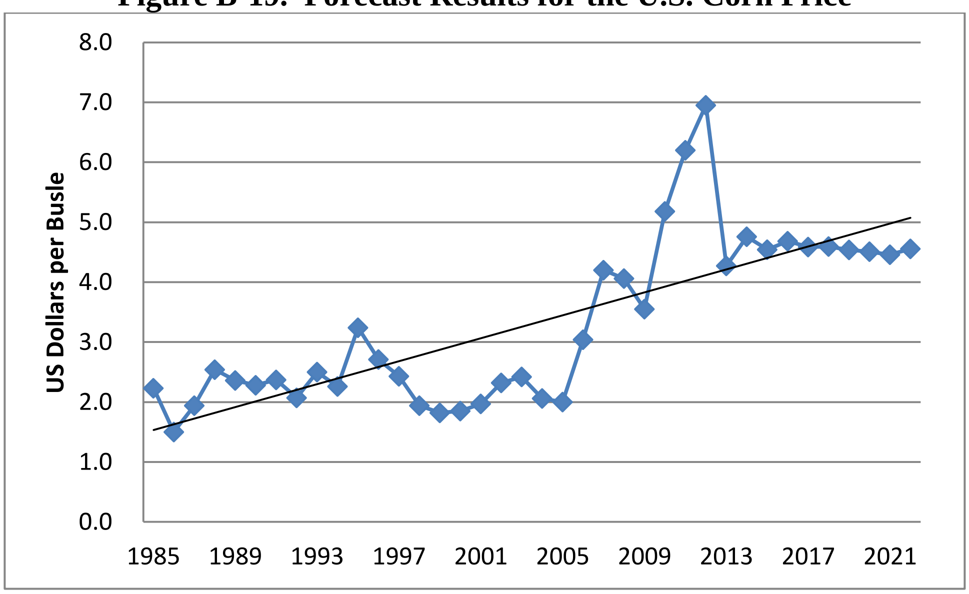


Figure B-20. Forecast Results for the U.S. Corn Total Planted Acres

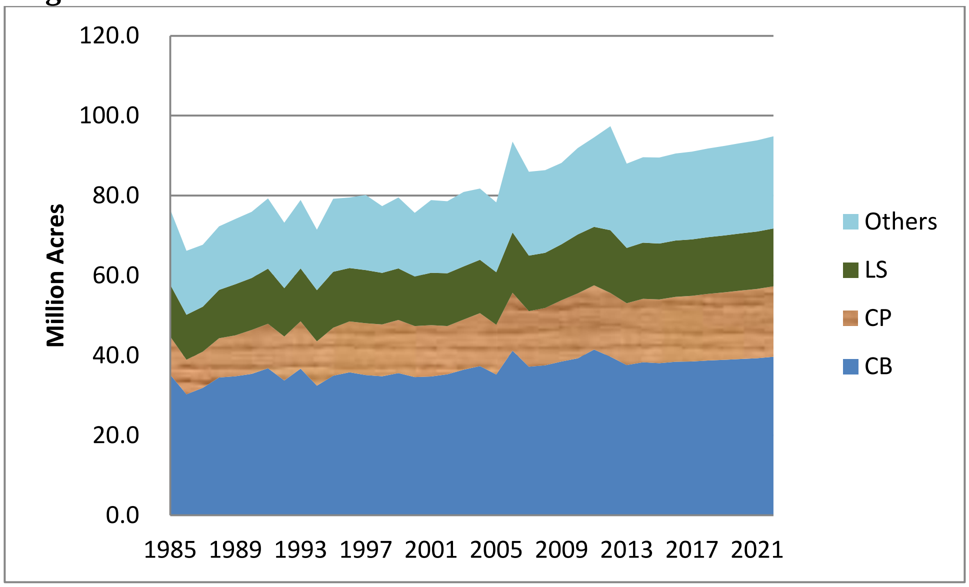


Figure B-21. Forecast Results for the U.S. Corn Total Production

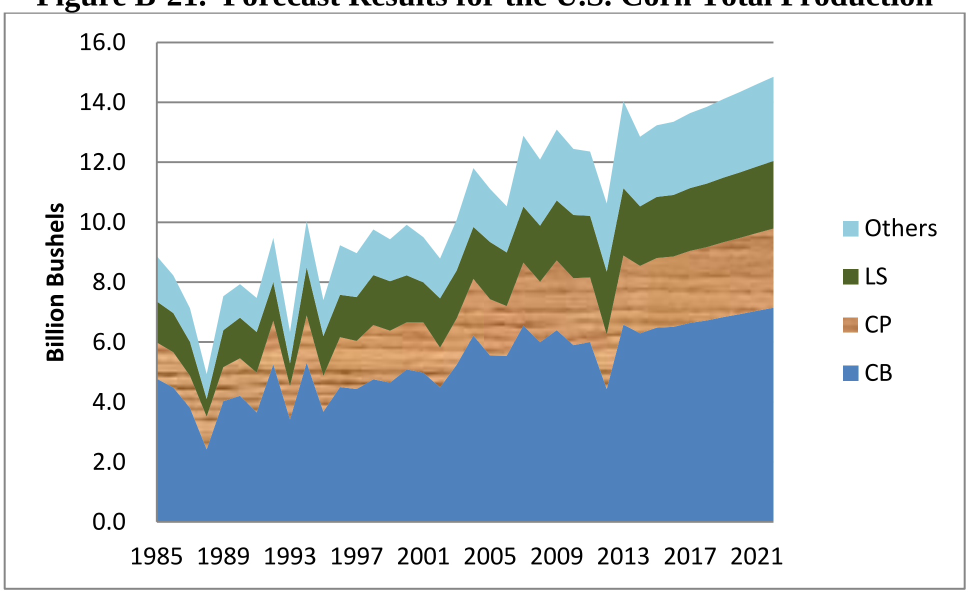
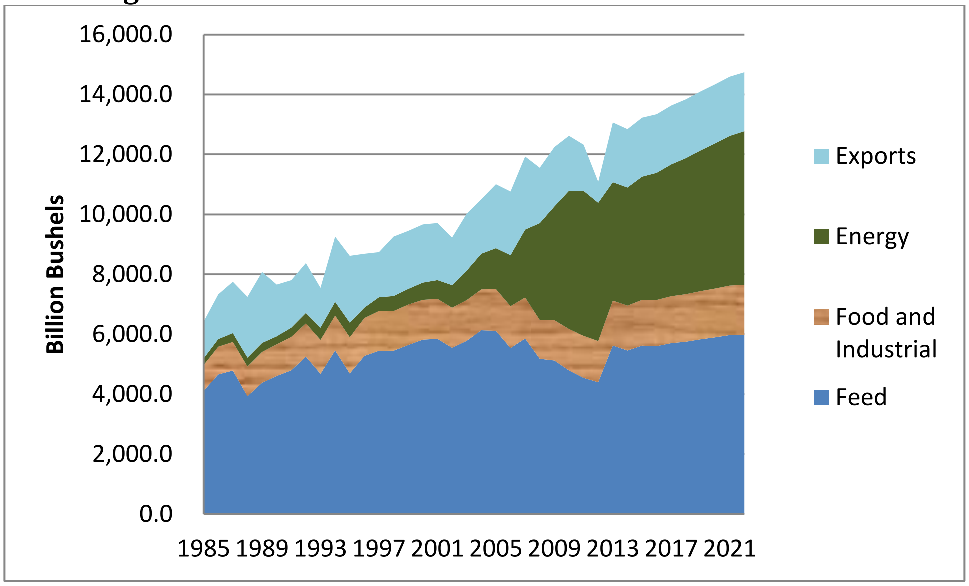


Figure B-22. Forecast Results for the U.S. Corn Demand



Note: 1) Corn seed use is not included in the figure because of its too tiny share.
2) Ending stocks are not presented in the figure.

Figure B-23. Forecast Results for Regional Corn ENRs

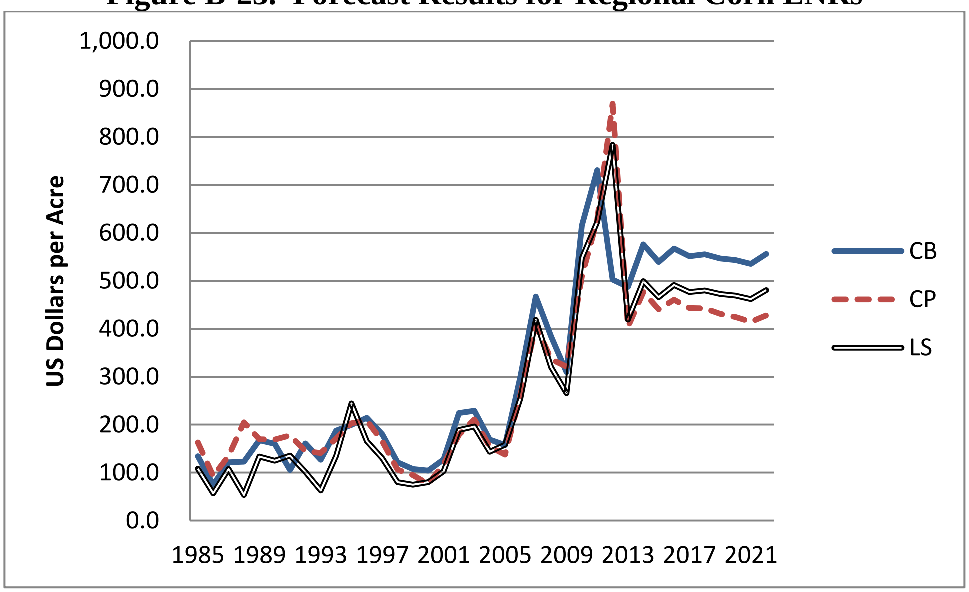


Figure B-24. Forecast Results for the U.S. Barley Price

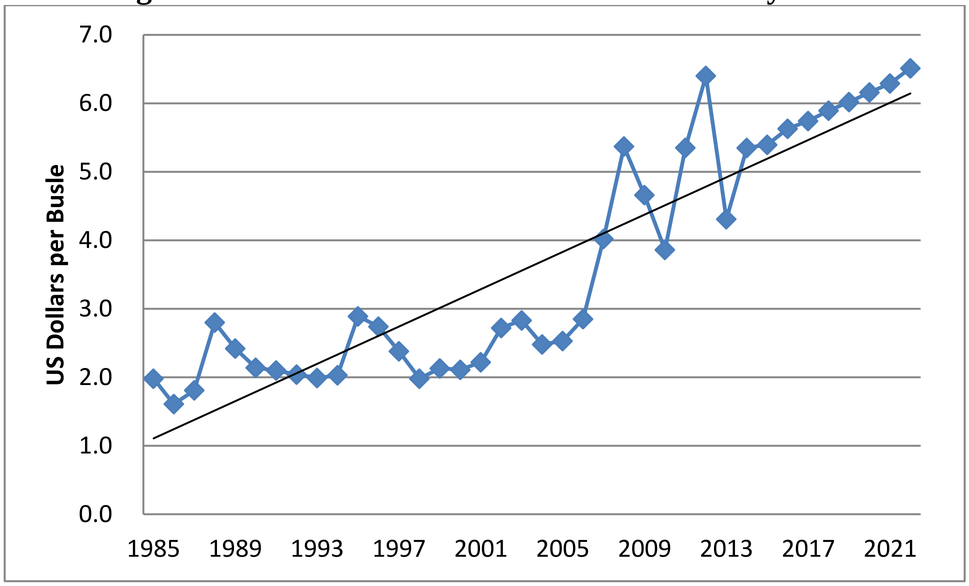


Figure B-25. Forecast Results for the U.S. Barley Total Planted Acres

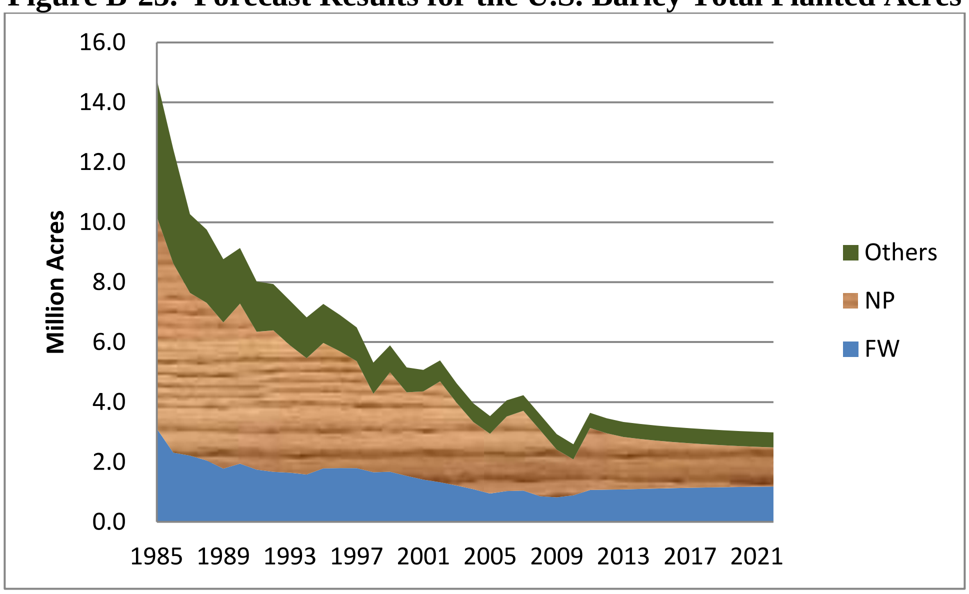


Figure B-26. Forecast Results for the U.S. Barley Total Production

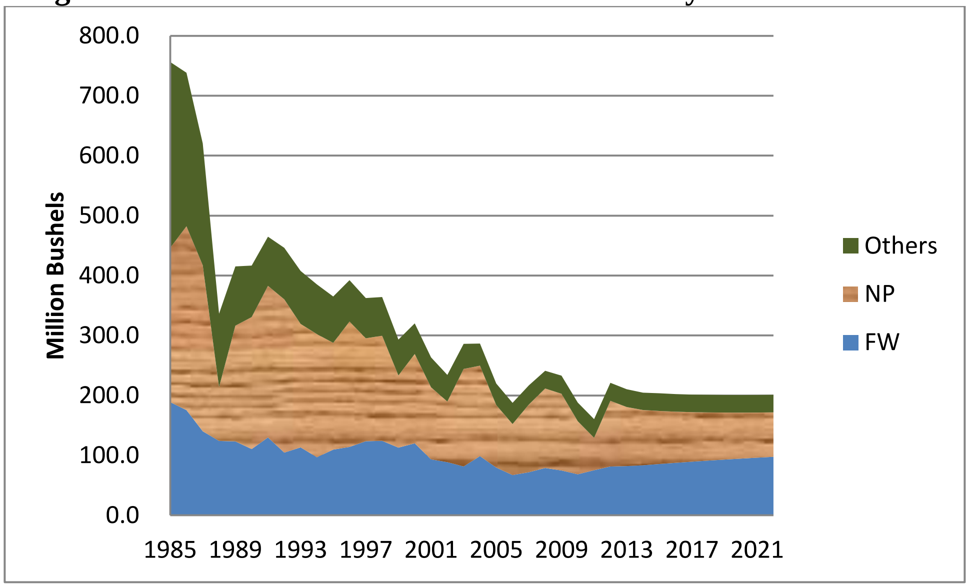
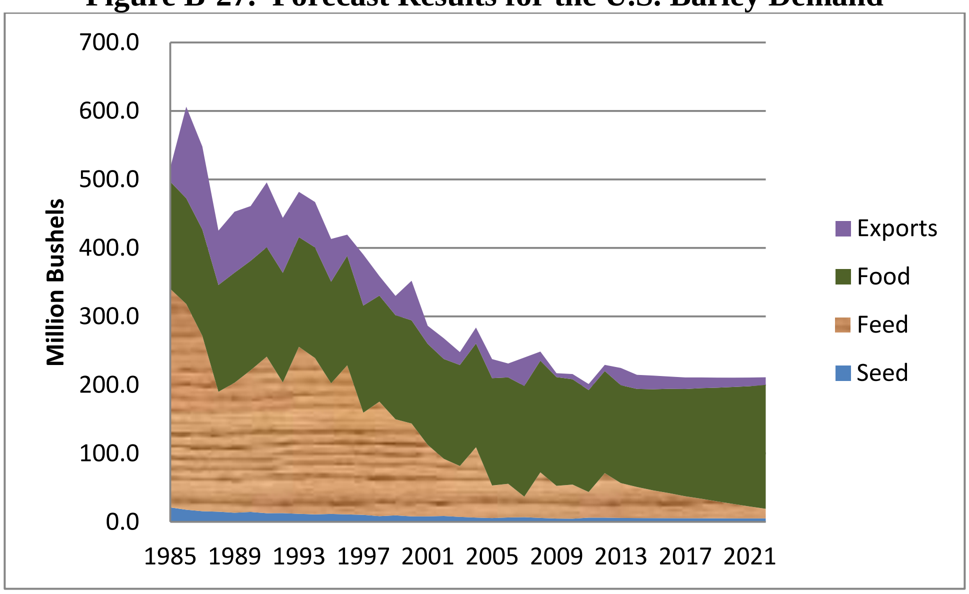


Figure B-27. Forecast Results for the U.S. Barley Demand



Note: Ending stocks are not presented in the figure.

Figure B-28. Forecast Results for Regional Barley ENRs

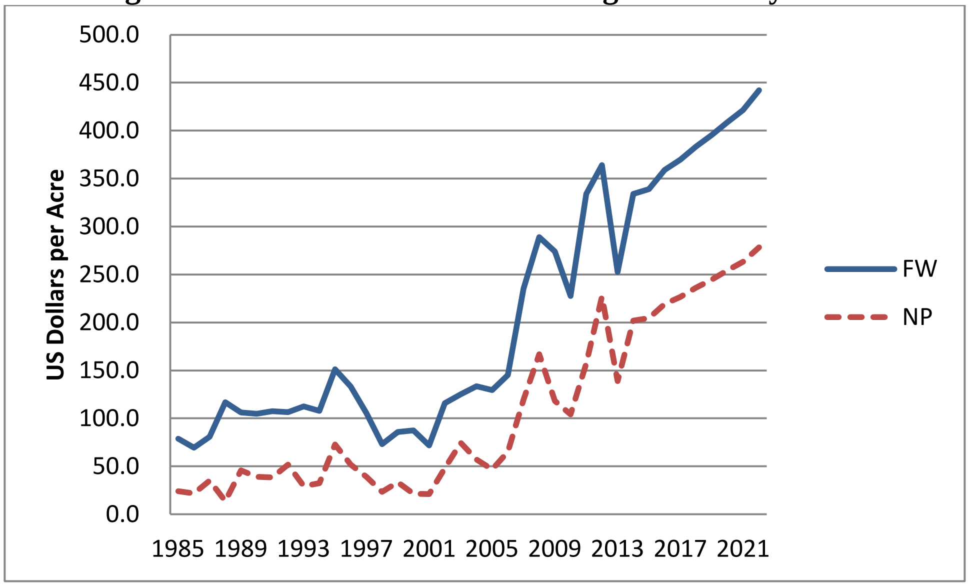


Figure B-29. Forecast Results for the U.S. Cotton Price

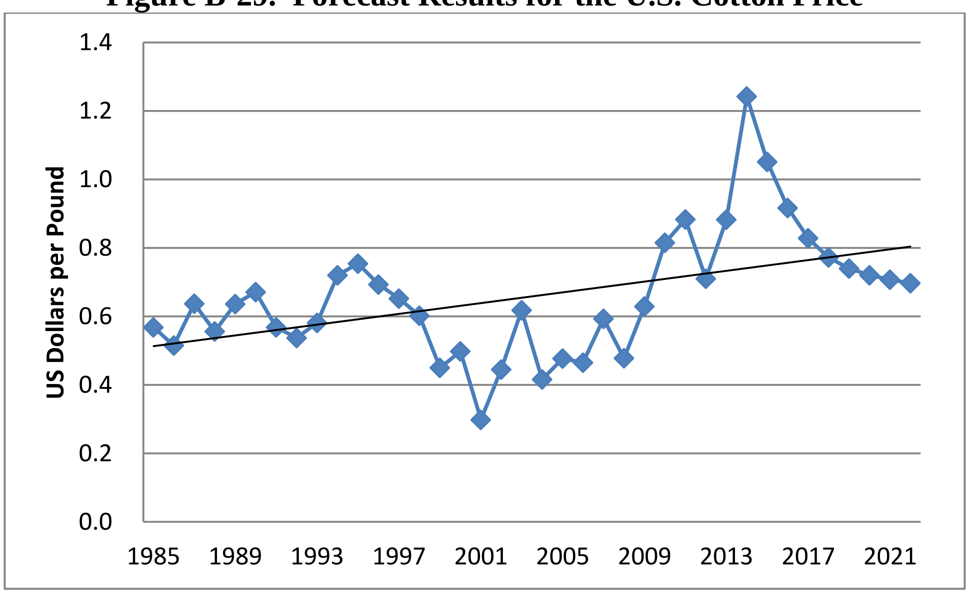


Figure B-30. Forecast Results for the U.S. Cotton Total Planted Acres

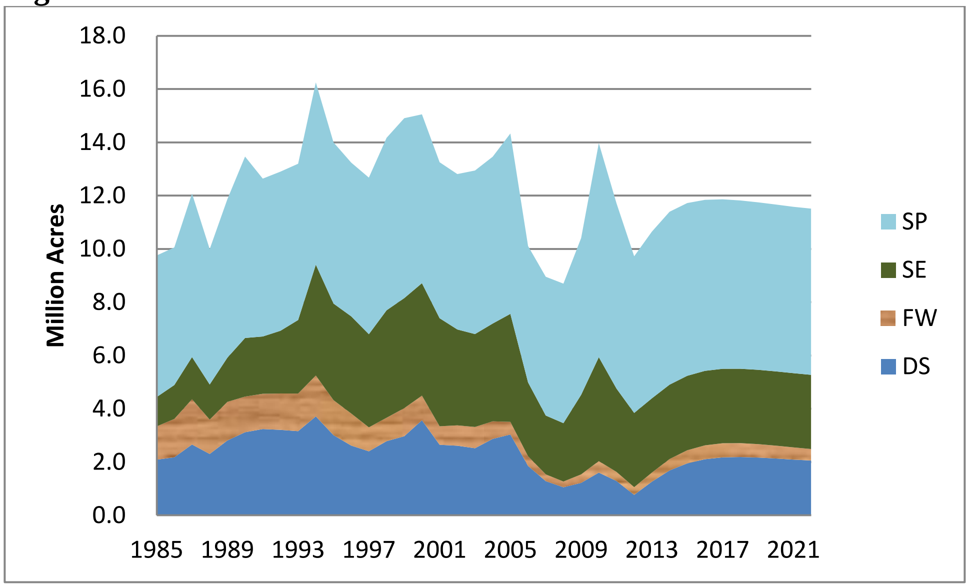


Figure B-31. Forecast Results for the U.S. Cotton Total Production

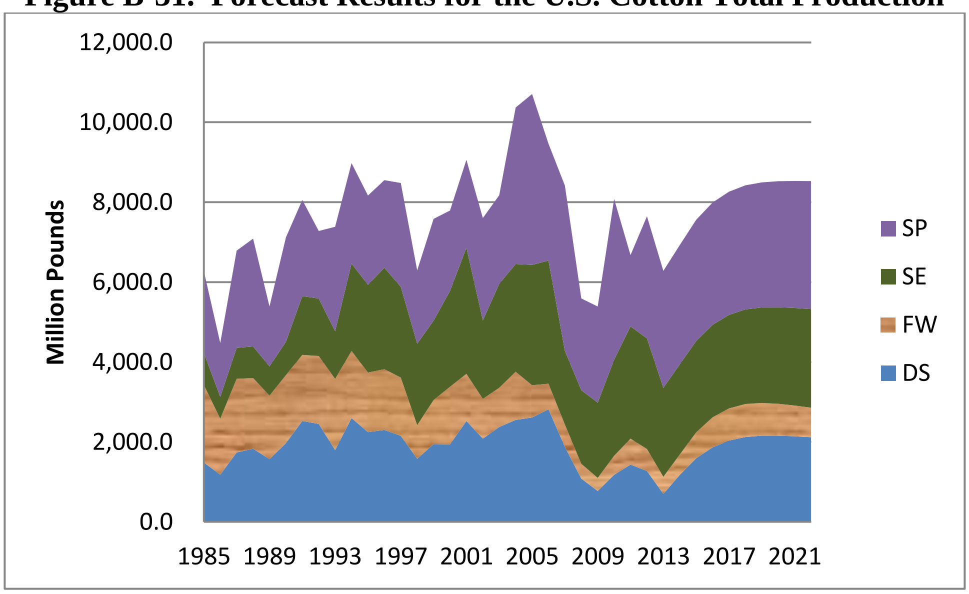
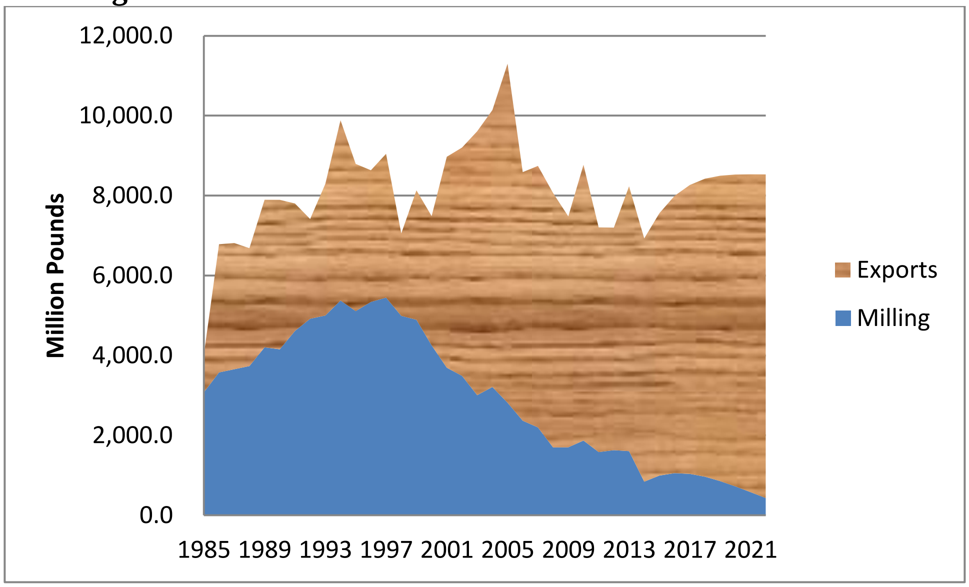


Figure B-32. Forecast Results for the U.S. Cotton Demand



Note: Ending stocks are not presented in the figure.

Figure B-33. Forecast Results for Regional Cotton ENRs

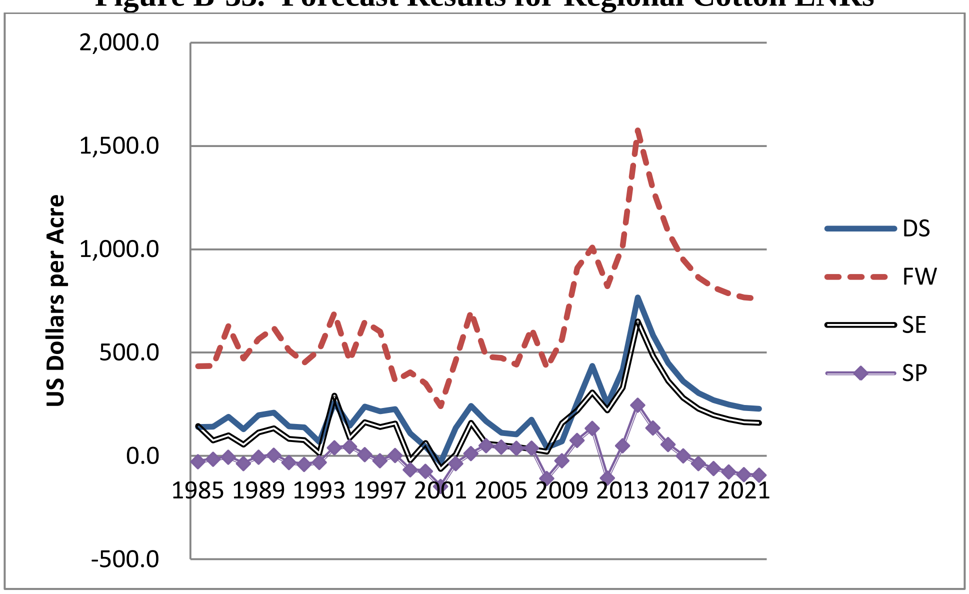


Figure B-34. Forecast Results for the U.S. Oat Price

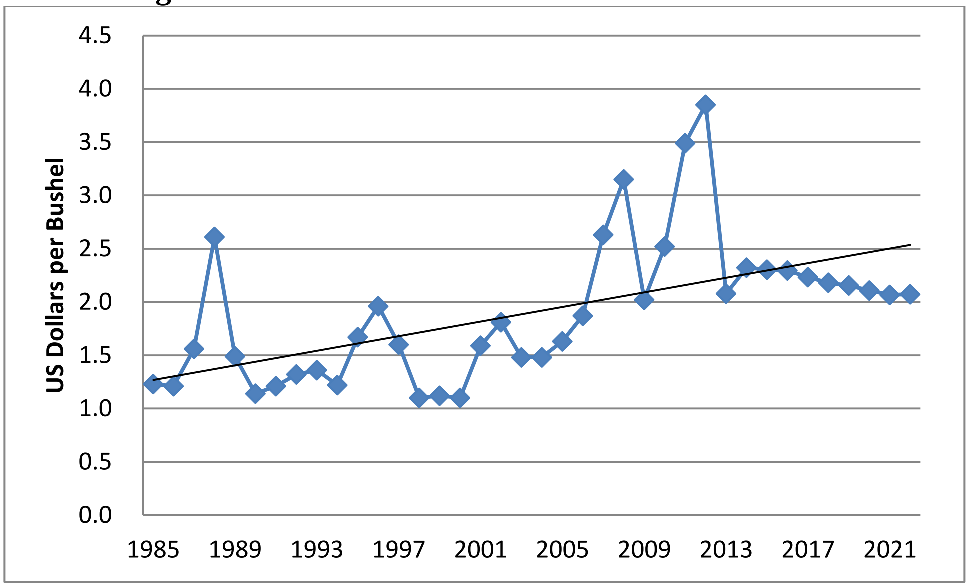


Figure B-35. Forecast Results for the U.S. Oat Total Planted Acres

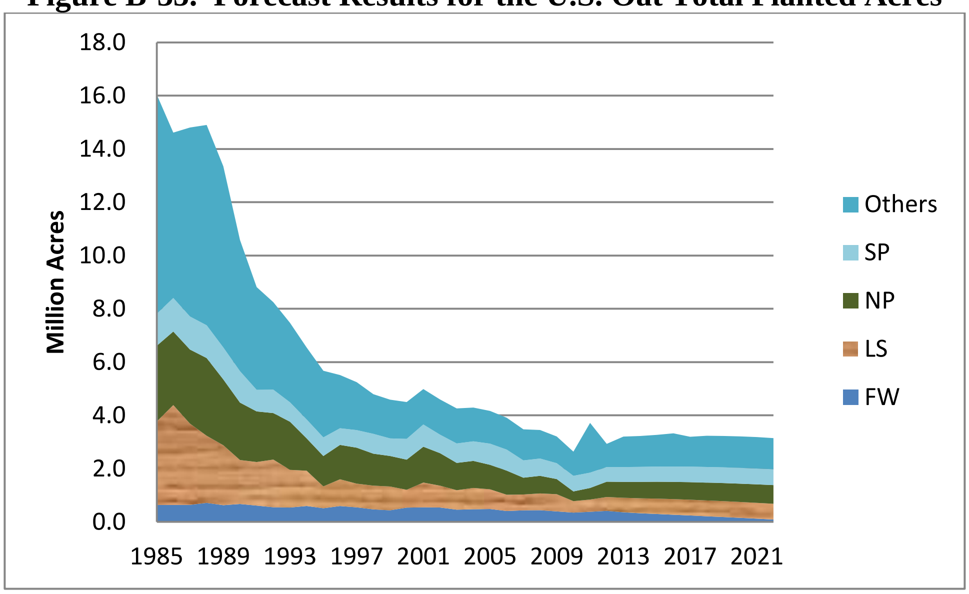


Figure B-36. Forecast Results for the U.S. Oat Total Production

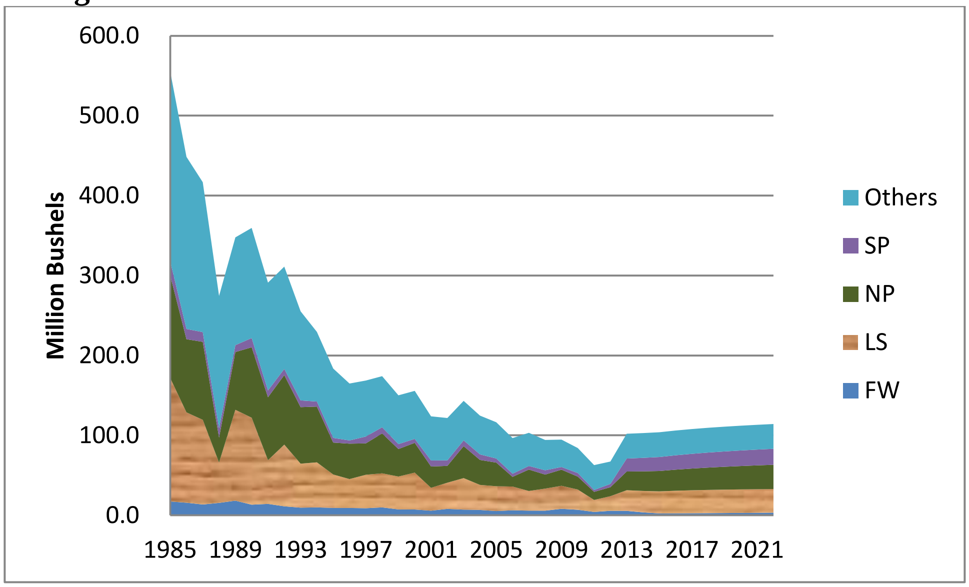
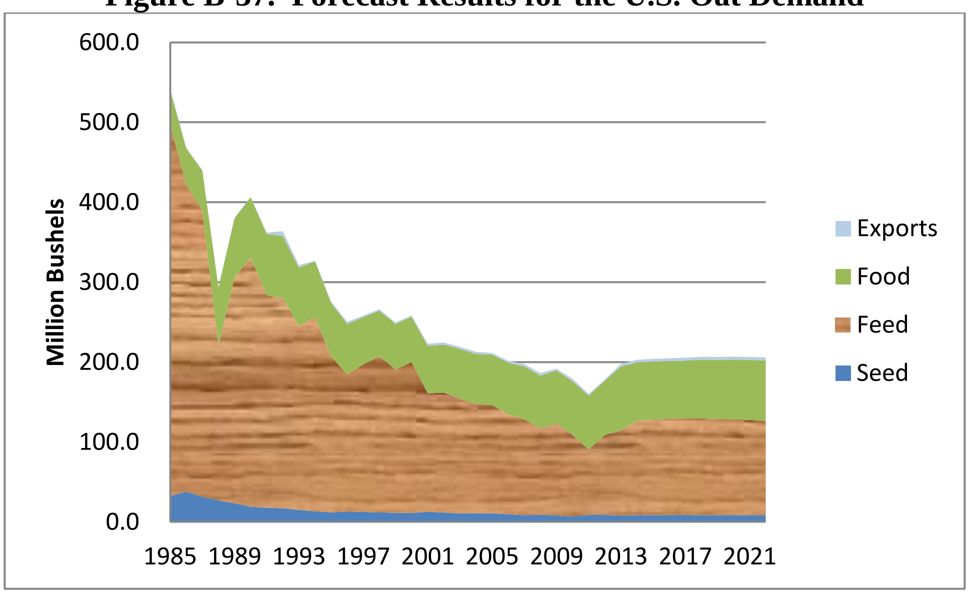


Figure B-37. Forecast Results for the U.S. Oat Demand



Note: Ending stocks are not presented in the figure.

Figure B-38. Forecast Results for Regional Oat ENRs

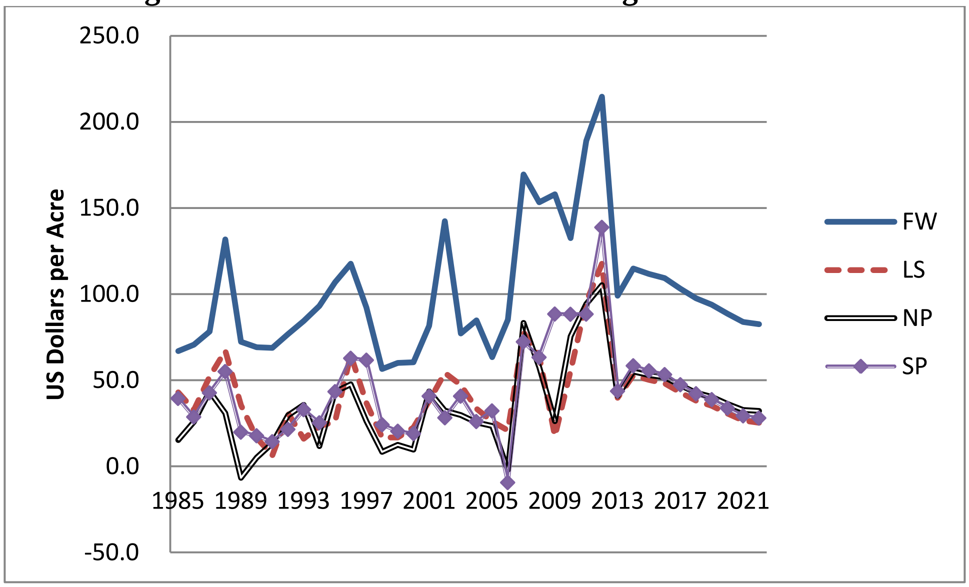


Figure B-39. Forecast Results for the U.S. LG Rice Price

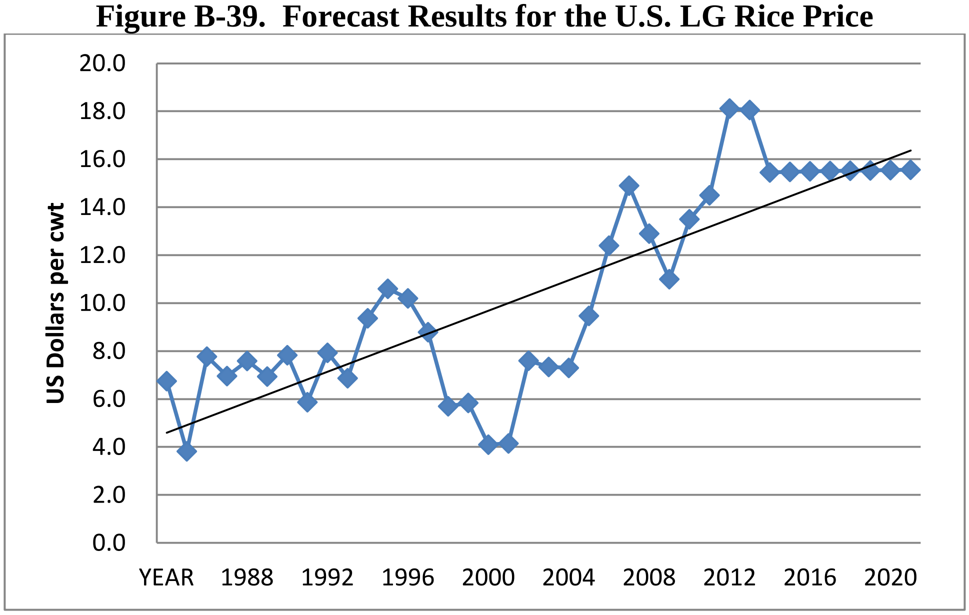


Figure B-40. Forecast Results for the U.S. LG Rice Total Planted Acres

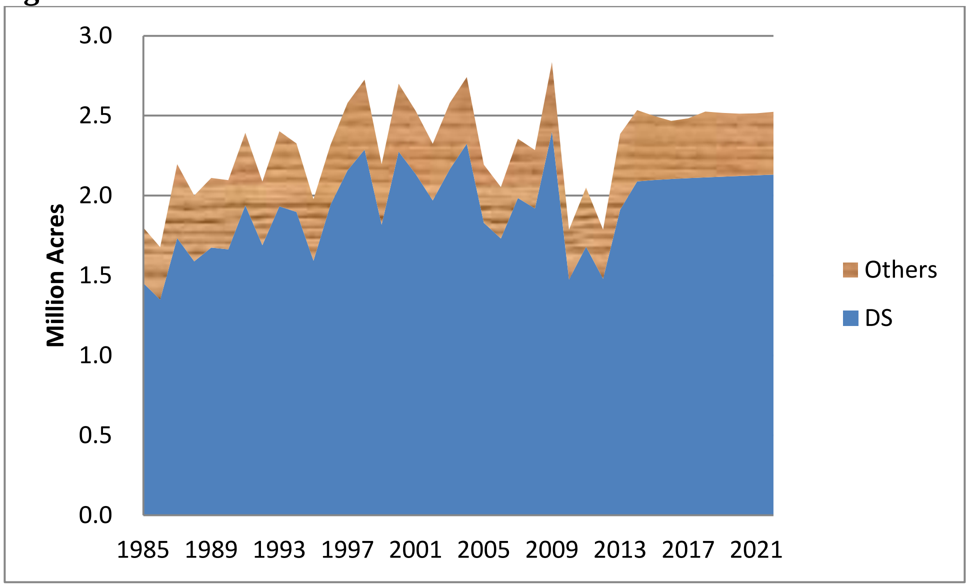


Figure B-41. Forecast Results for the U.S. LG Rice Total Production

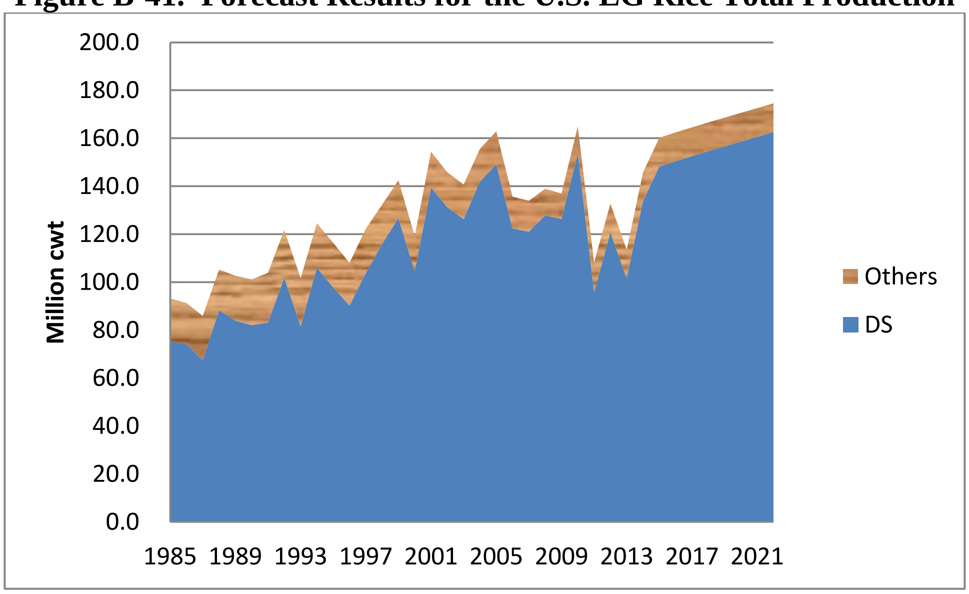
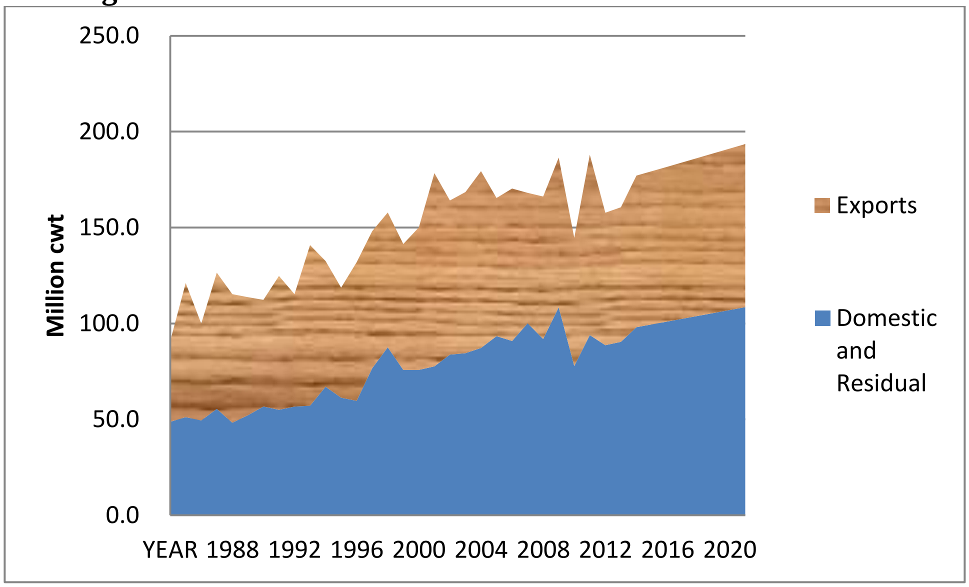


Figure B-42. Forecast Results for the U.S. LG Rice Demand



Note: Ending stocks are not presented in the figure.

Figure B-43. Forecast Results for Regional LG Rice ENRs

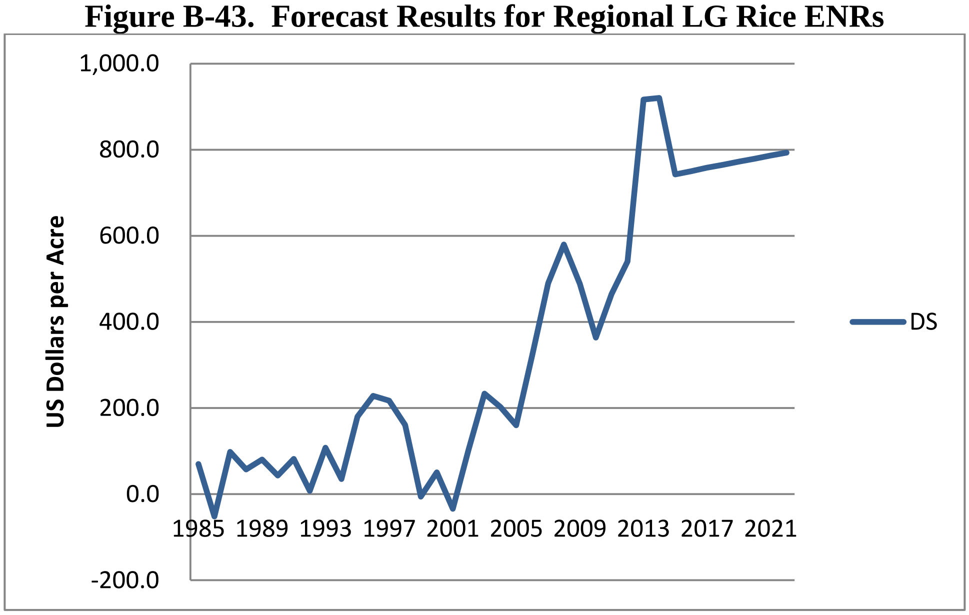


Figure B-44. Forecast Results for the U.S. MSG Rice Price

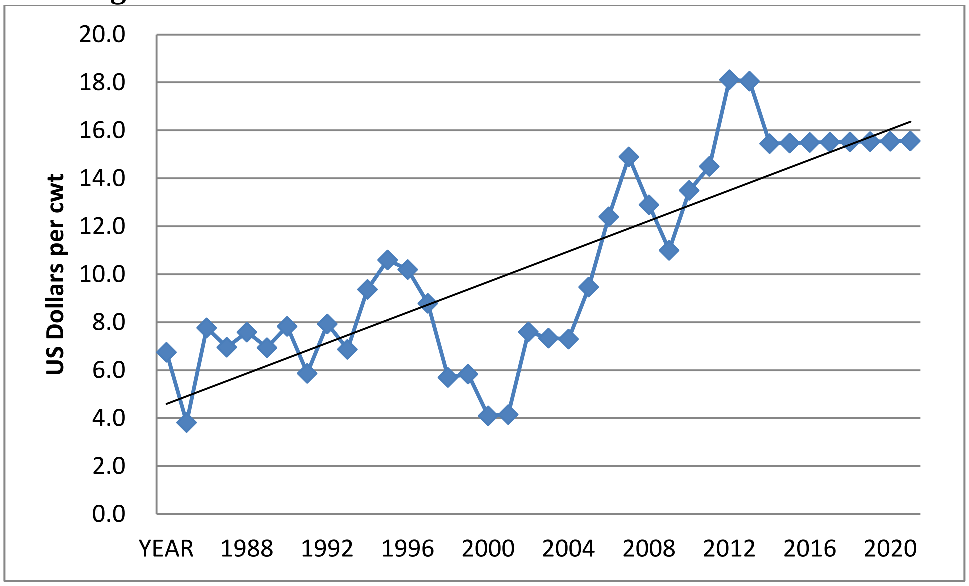


Figure B-45. Forecast Results for the U.S. MSG Rice Total Planted Acres

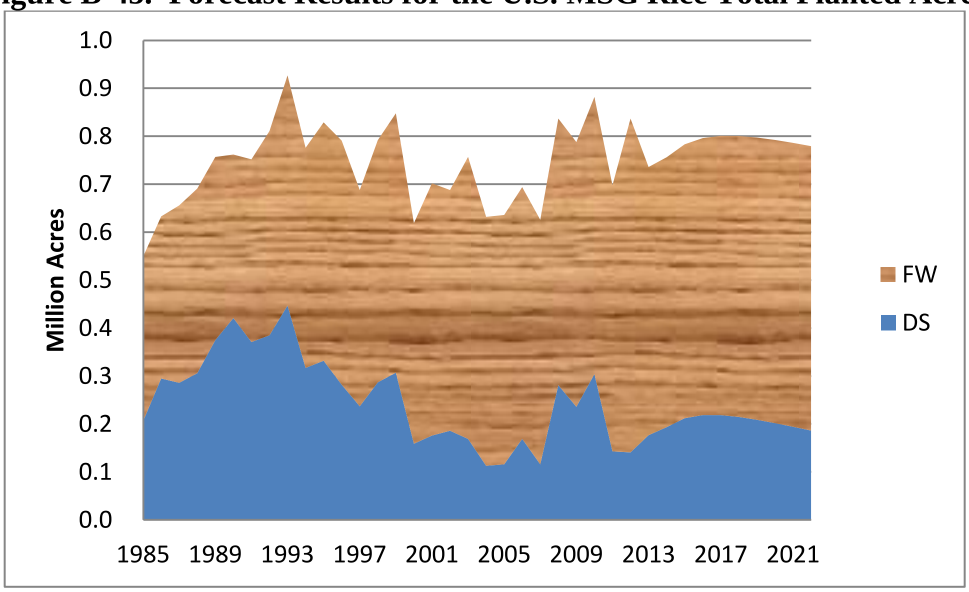


Figure B-46. Forecast Results for the U.S. MSG Rice Total Production

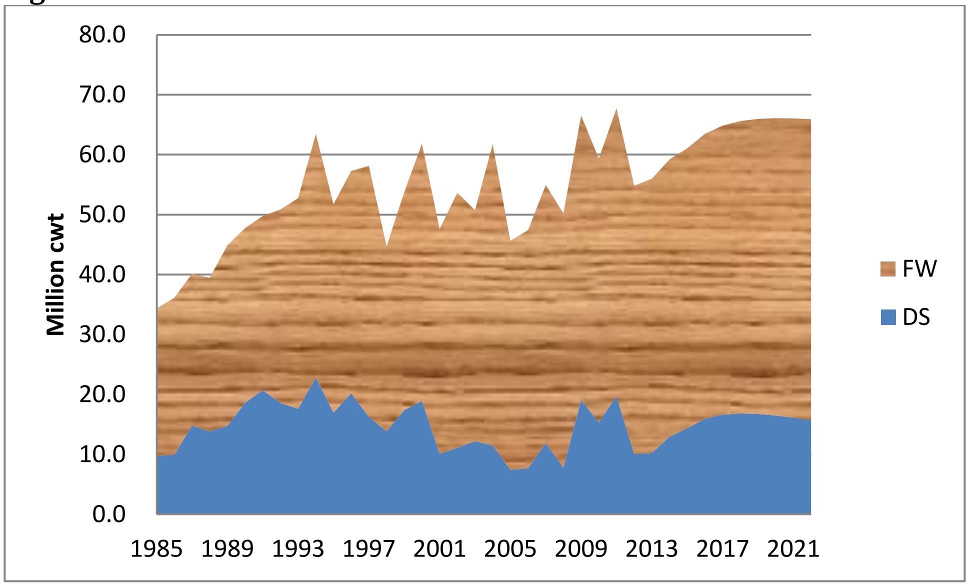
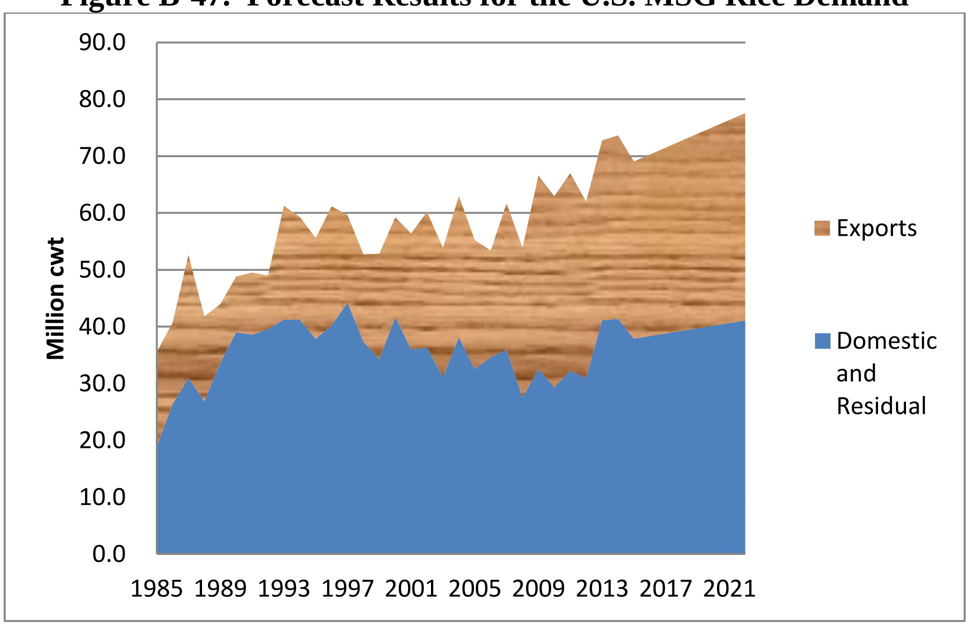


Figure B-47. Forecast Results for the U.S. MSG Rice Demand



Note: Ending stocks are not presented in the figure.

Figure B-48. Forecast Results for Regional MSG Rice ENRs

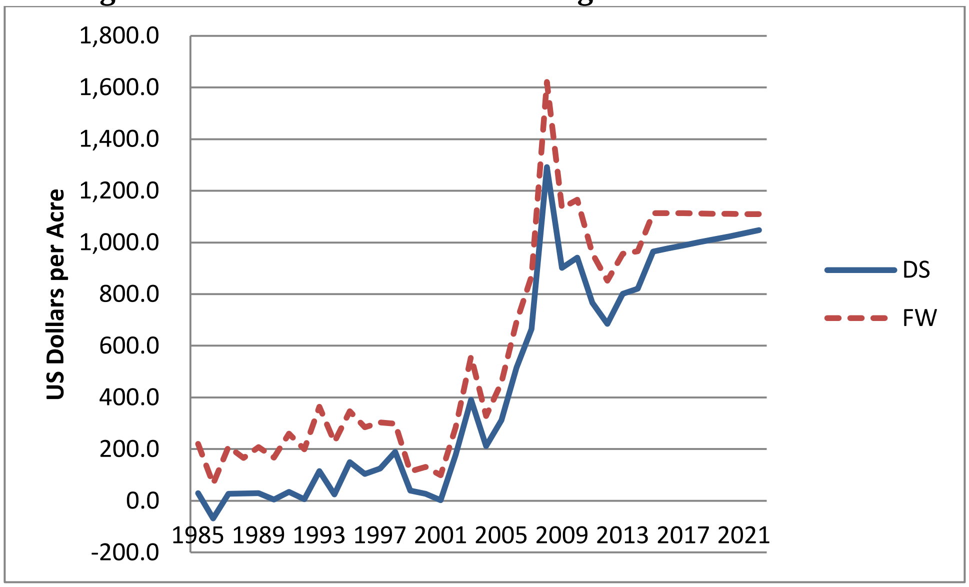


Figure B-49. Forecast Results for the U.S. Sorghum Price

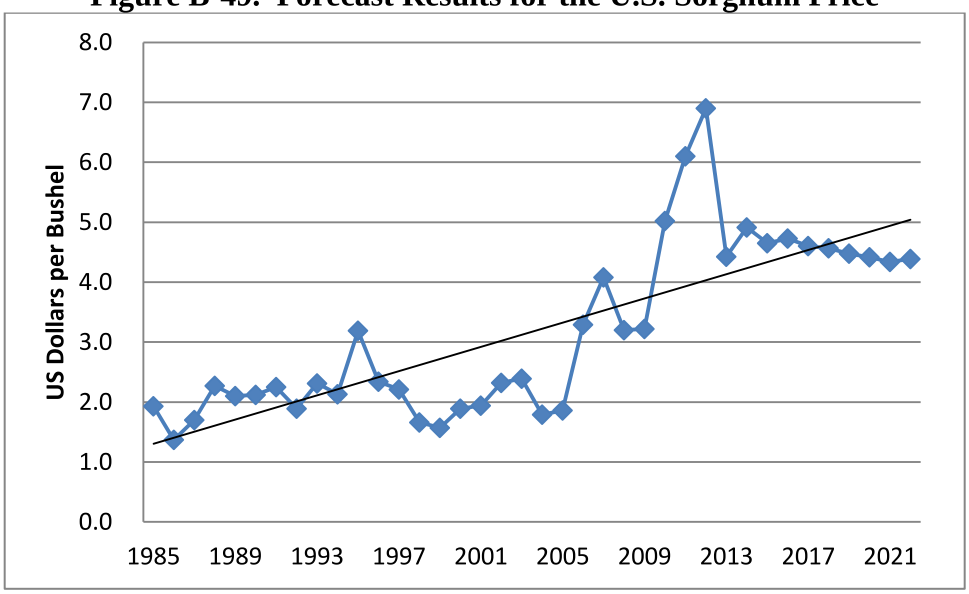


Figure B-50. Forecast Results for the U.S. Sorghum Total Planted Acres

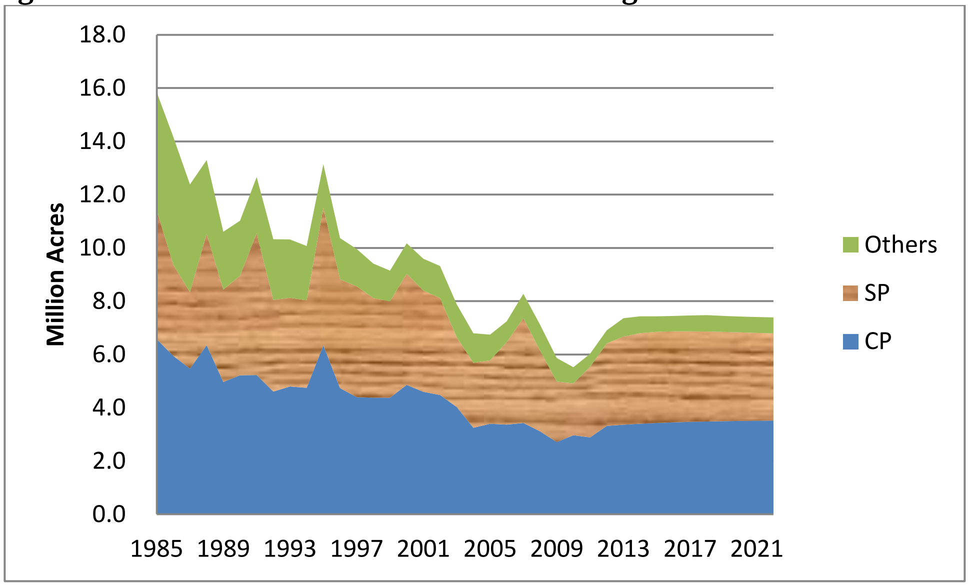


Figure B-51. Forecast Results for the U.S. Sorghum Total Production

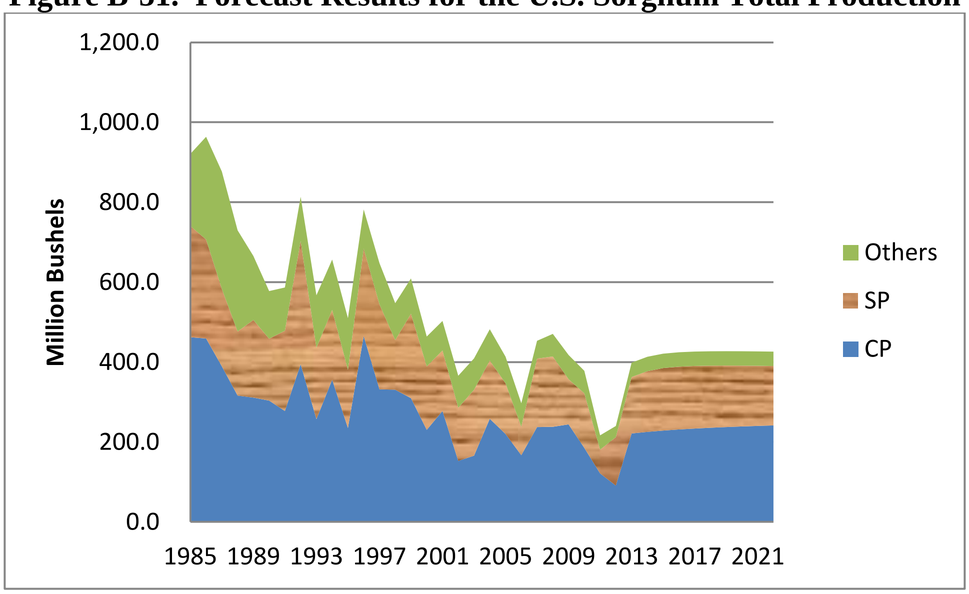
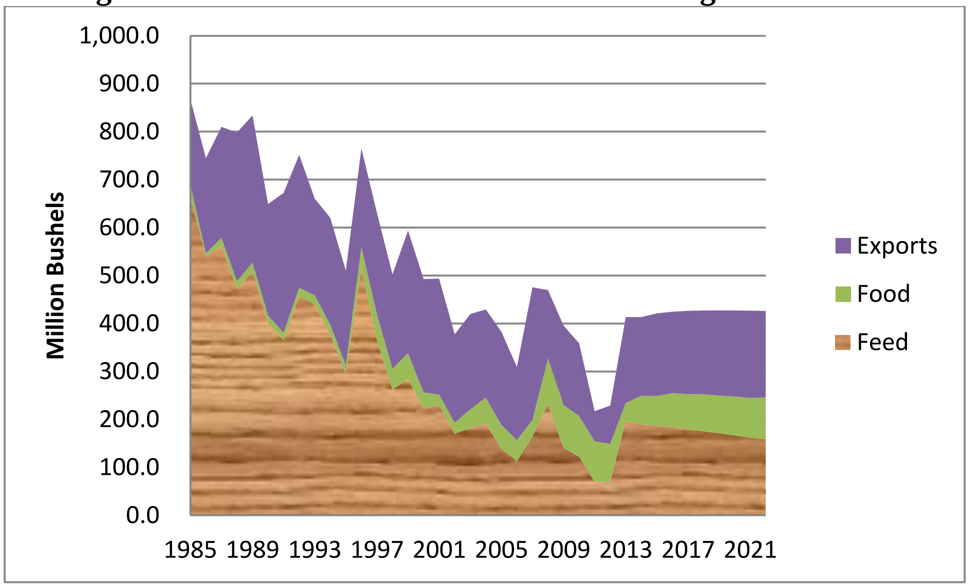


Figure B-52. Forecast Results for the U.S. Sorghum Demand



Note: Sorghum seed use and ending stocks are not presented in the figure.

Figure B-53. Forecast Results for Regional Sorghum ENRs

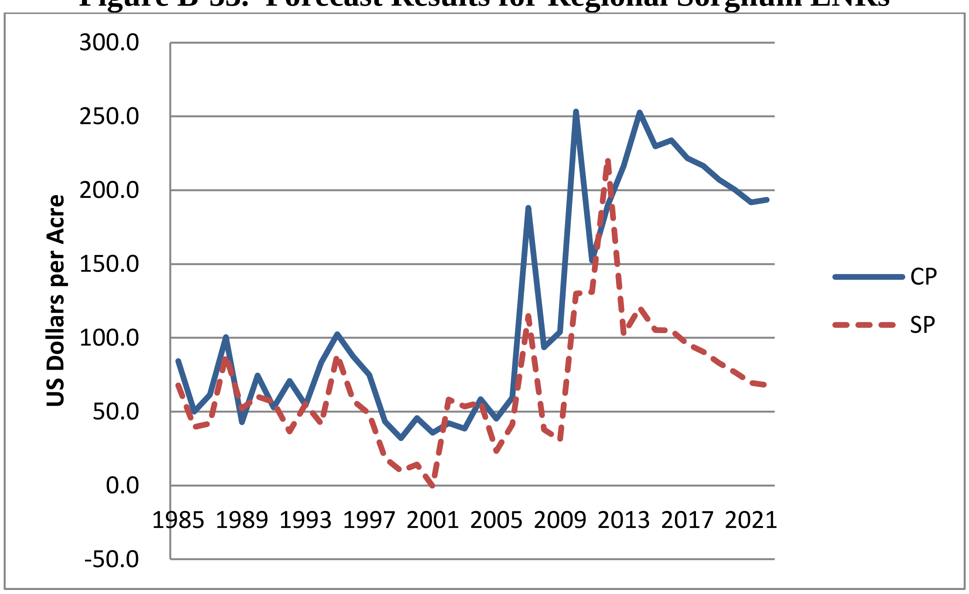


Figure B-54. Forecast Results for the U.S. Soybean Price

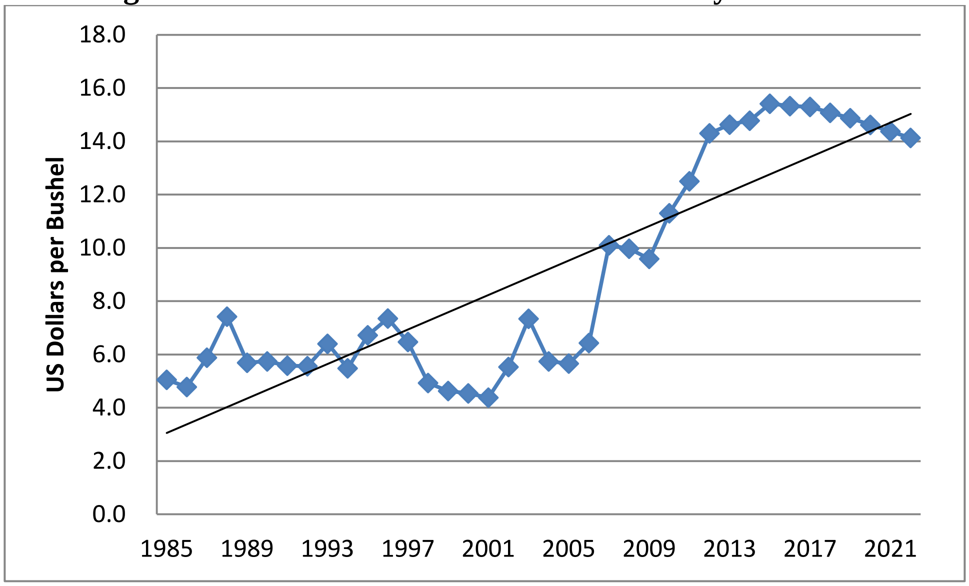


Figure B-55. Forecast Results for the U.S. Soybean Total Planted Acres

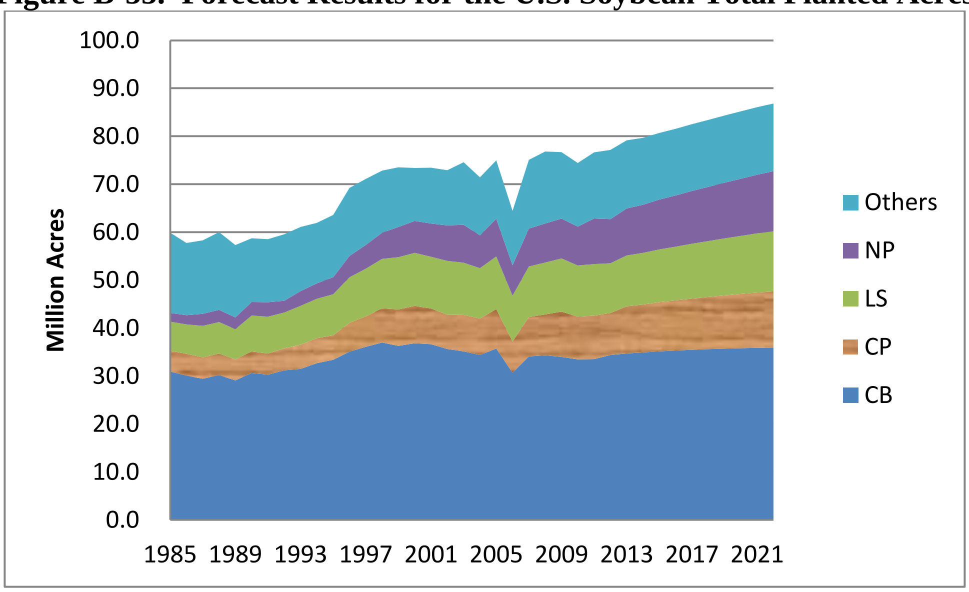


Figure B-56. Forecast Results for the U.S. Soybean Total Production

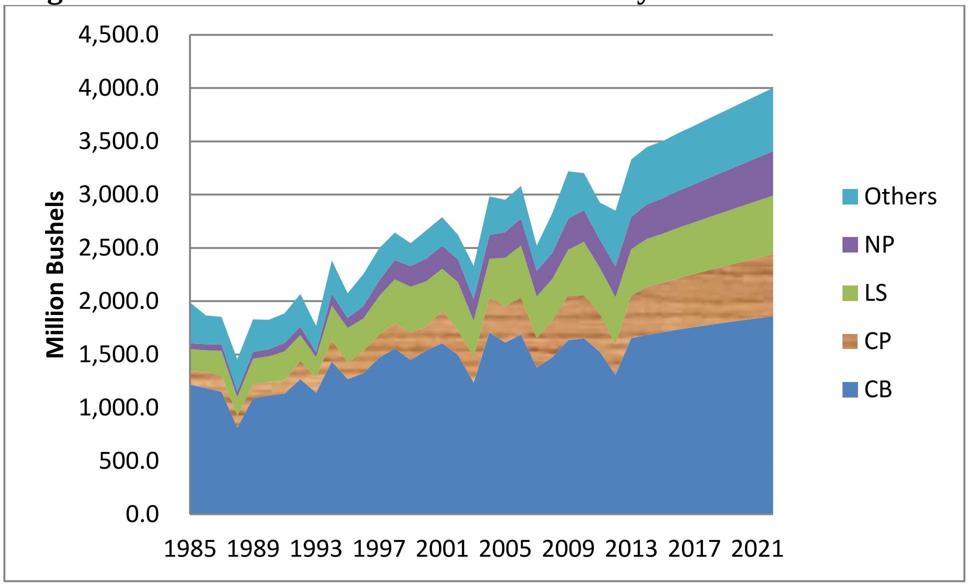


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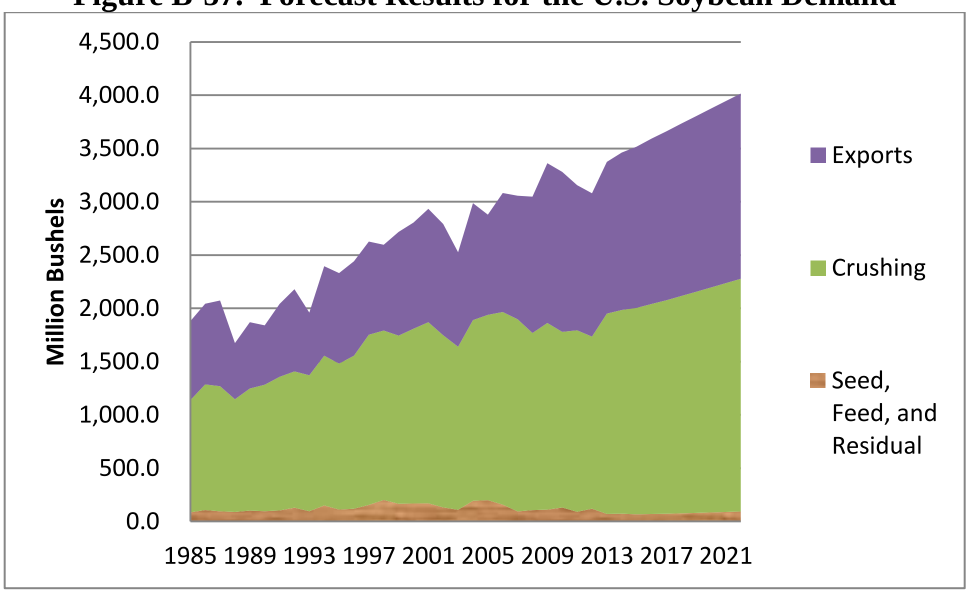
Figure B-57. Forecast Results for the U.S. Soybean Demand



Note: Ending stocks are not presented in the figure.

Figure B-58. Forecast Results for Regional Soybeans ENRs

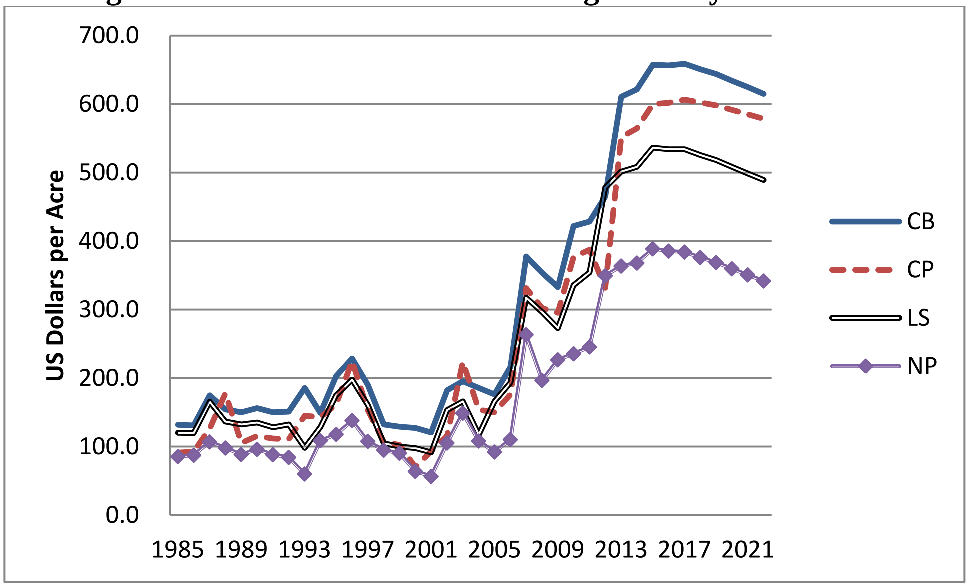


Figure B-59. Forecast Results for the U.S. Soybean Meal Price

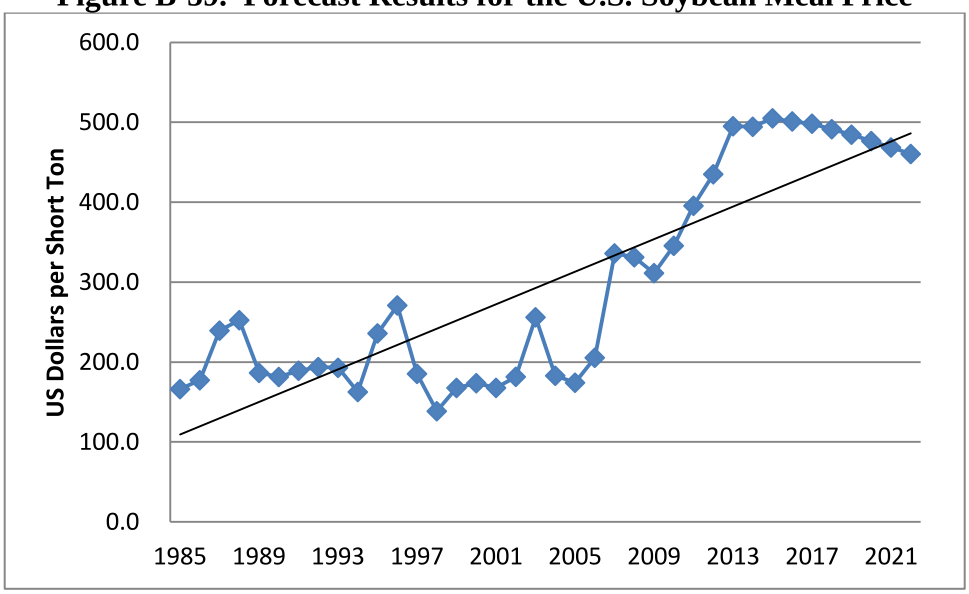


Figure B-60. Forecast Results for the U.S. Soybean Meal Total Production

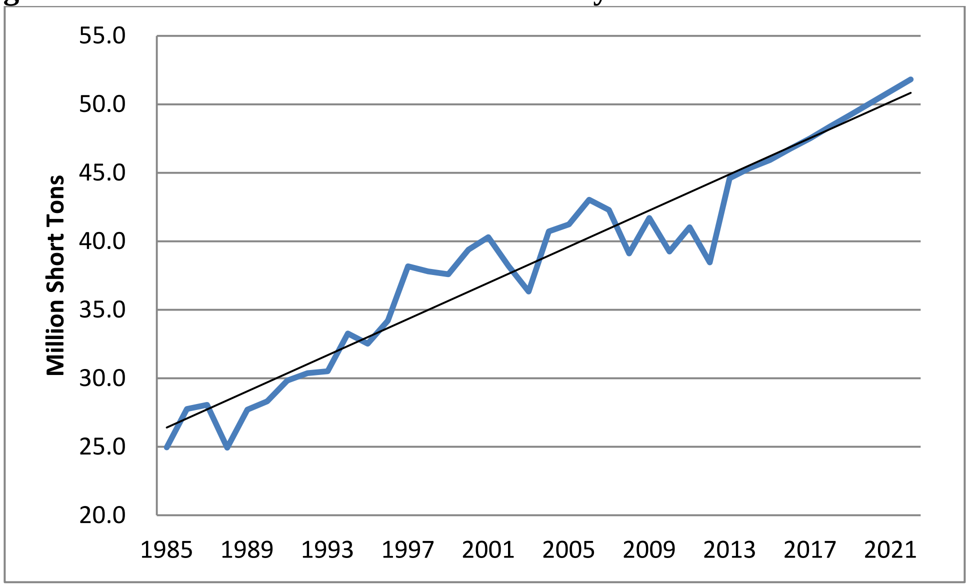
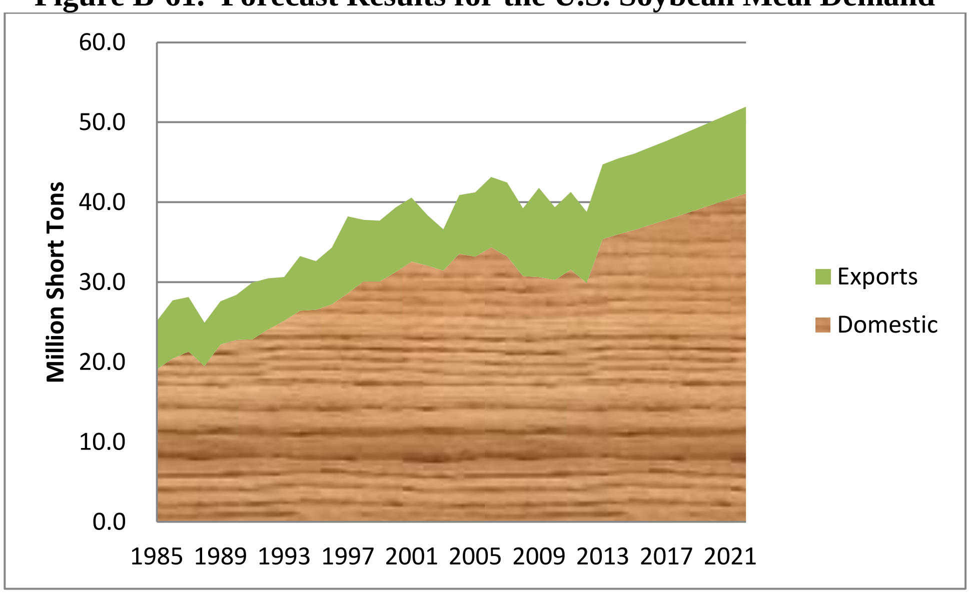


Figure B-61. Forecast Results for the U.S. Soybean Meal Demand



Note: Ending stocks are not presented in the figure.

Figure B-62. Forecast Results for the U.S. Soybean Oil Price

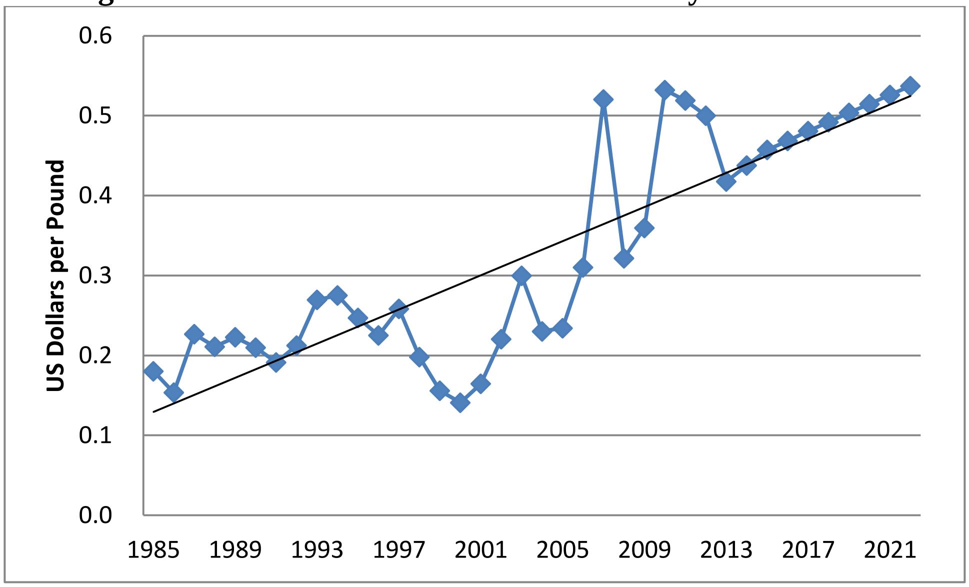


Figure B-63. Forecast Results for the U.S. Soybean Oil Total Production

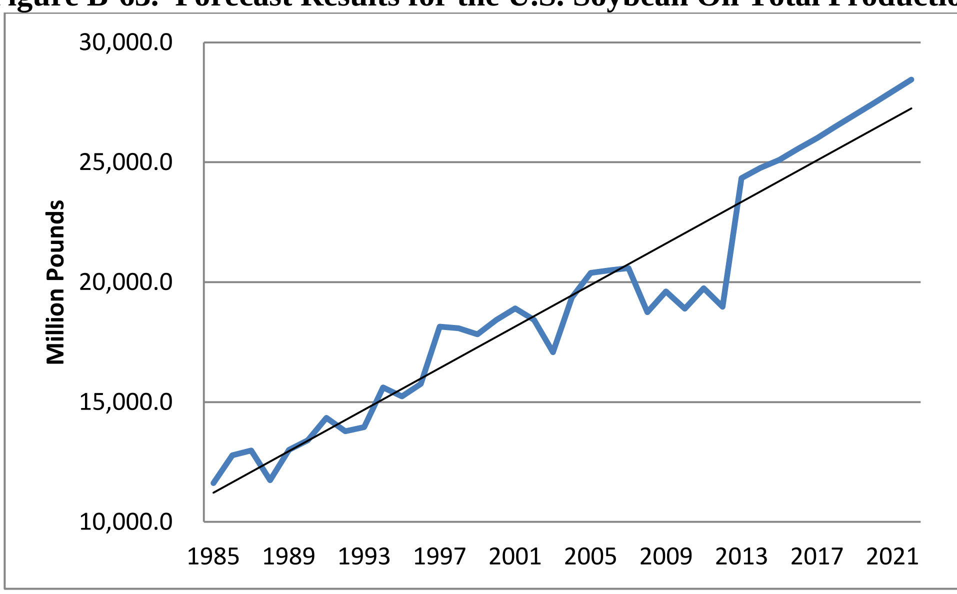
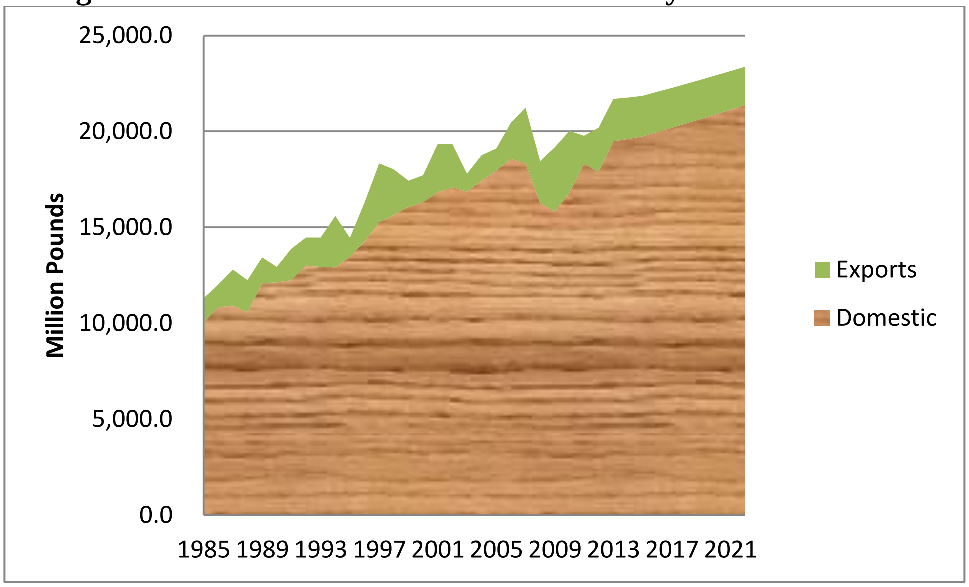


Figure B-64. Forecast Results for the U.S. Soybean Oil Demand



Note: Ending stocks are not presented in the figure.

Figure B-65. Forecast Results for the U.S. Wheat Price

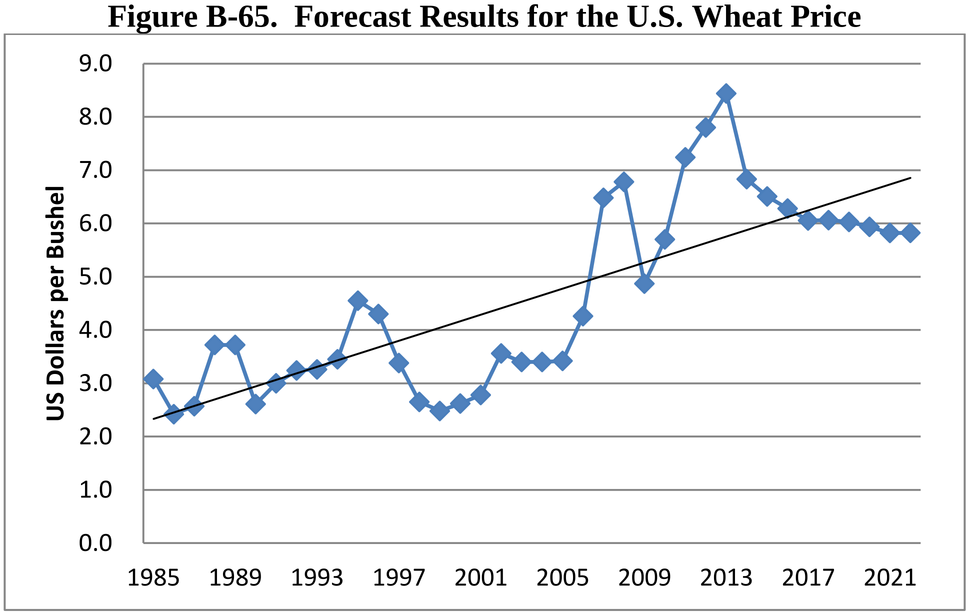


Figure B-66. Forecast Results for the U.S. Wheat Total Planted Acres

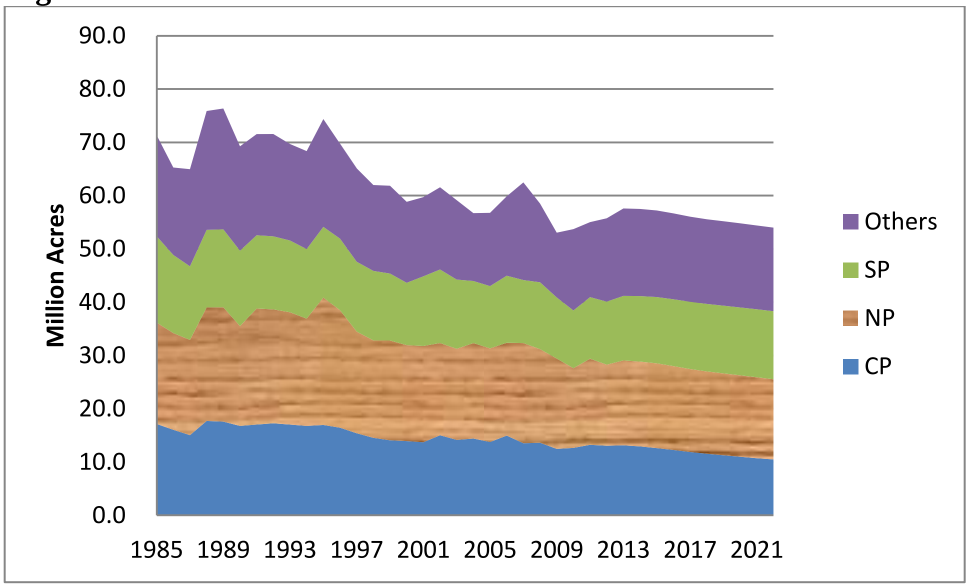


Figure B-67. Forecast Results for the U.S. Wheat Total Production

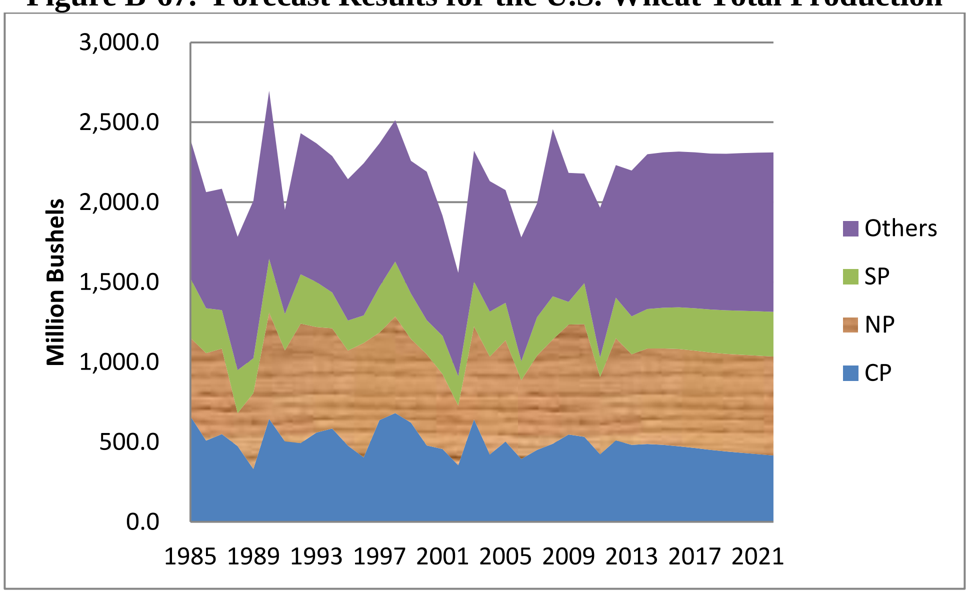
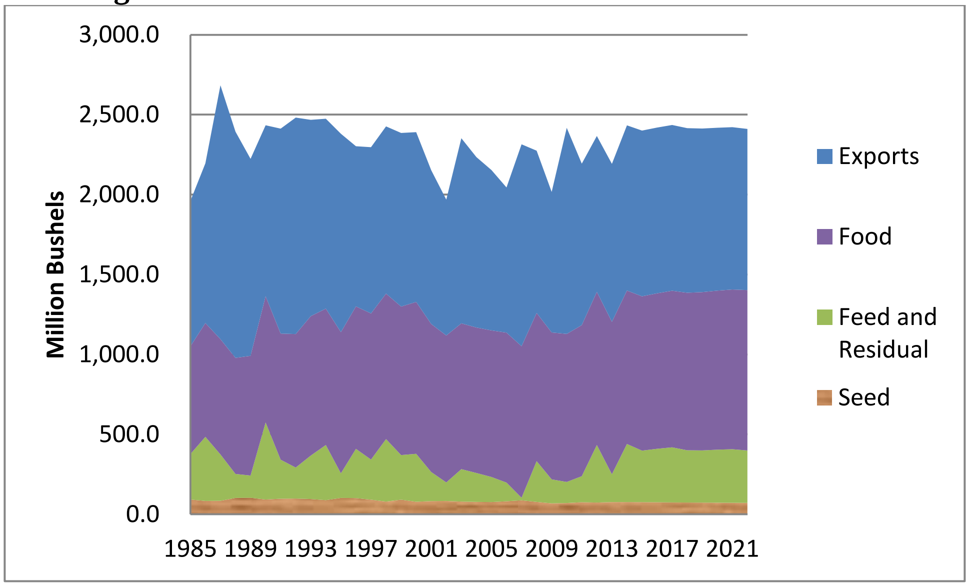


Figure B-68. Forecast Results for the U.S. Wheat Demand



Note: Ending stocks are not presented in the figure.

Figure B-69. Forecast Results for Regional Wheat ENRs

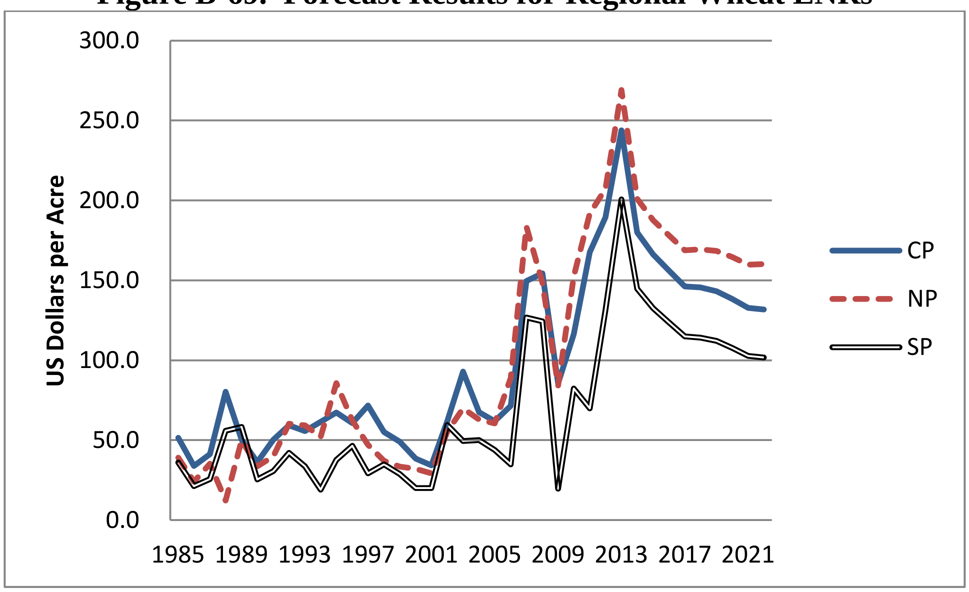


Figure B-70. Forecast Results for the U.S. Peanut Price

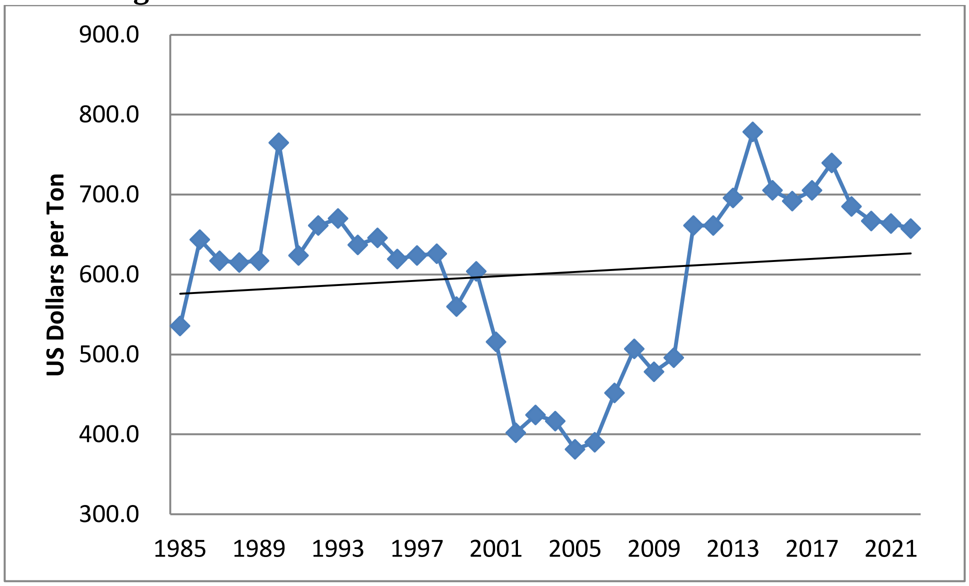


Figure B-71. Forecast Results for the U.S. Peanut Total Planted Acres

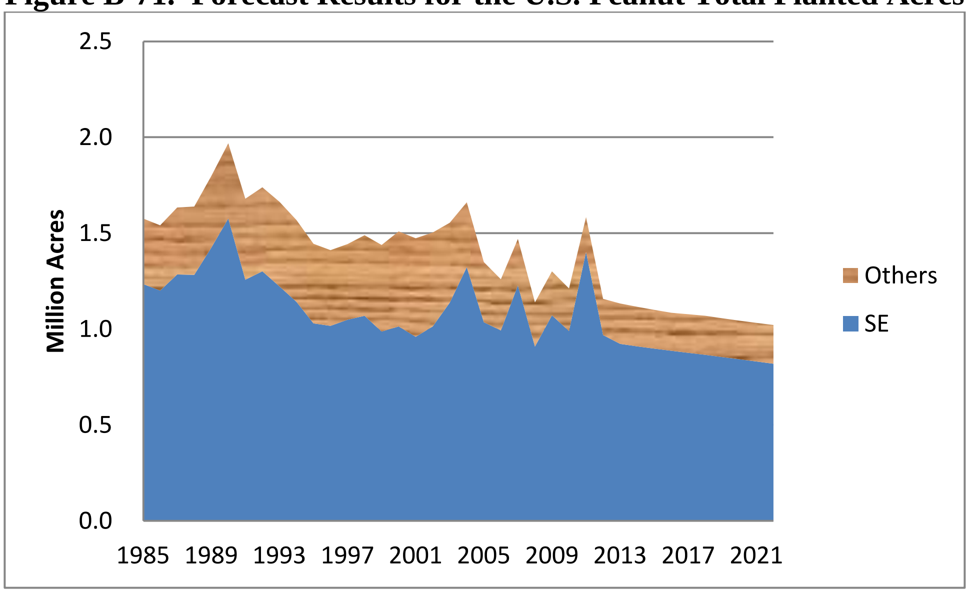


Figure B-72. Forecast Results for the U.S. Peanut Total Production

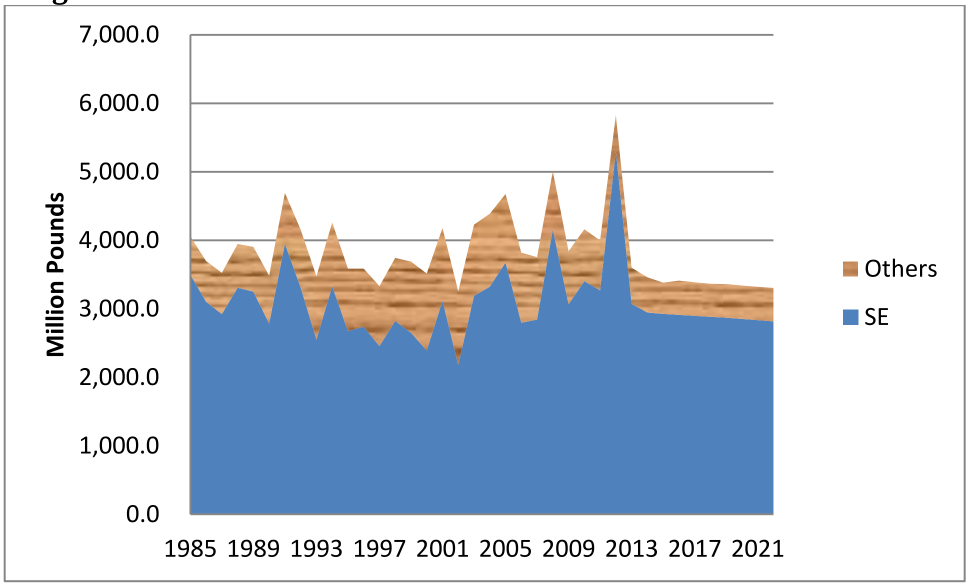
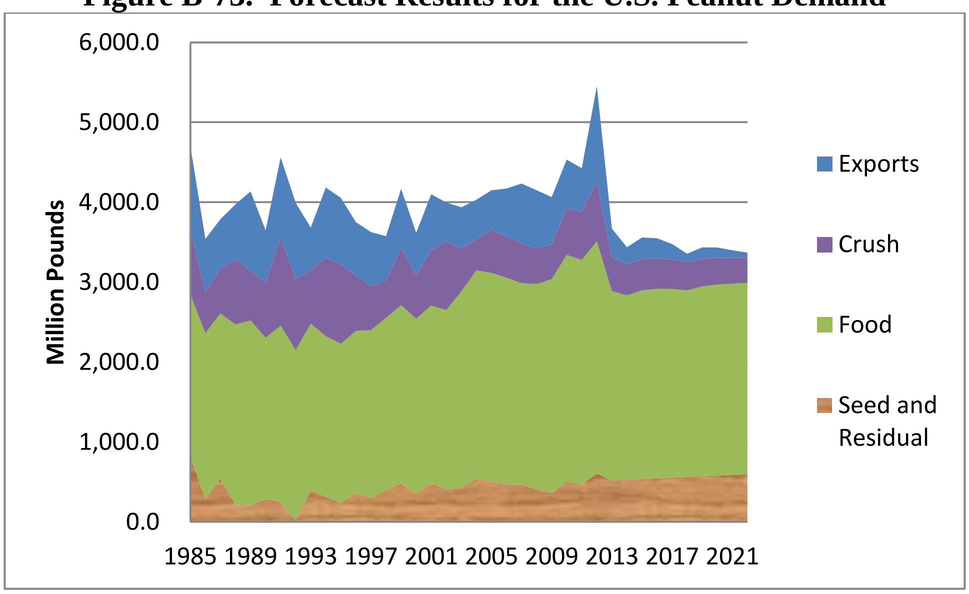


Figure B-73. Forecast Results for the U.S. Peanut Demand



Note: Ending stocks are not presented in the figure.

Figure B-74. Forecast Results for Regional Peanut ENRs

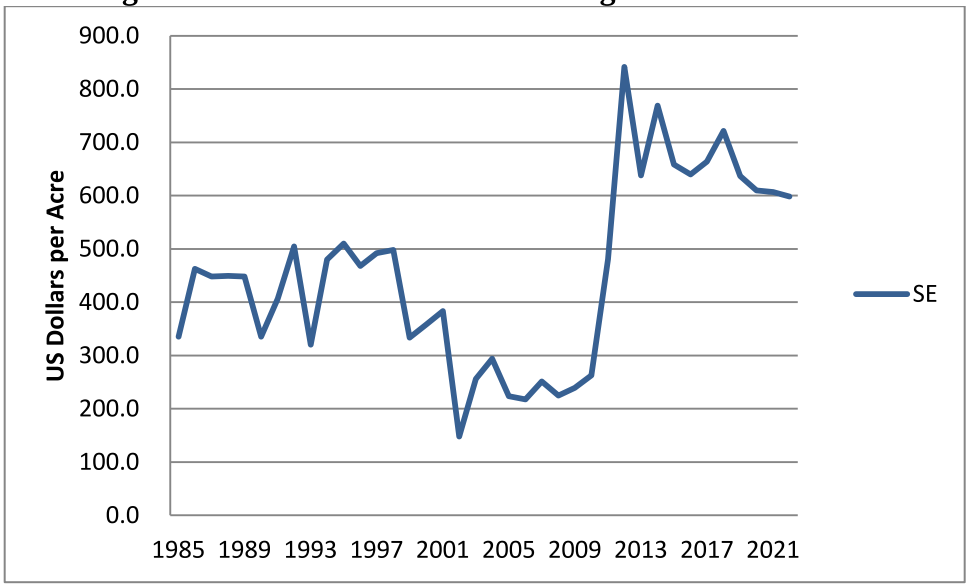


Figure B-75. Forecast Results for the U.S. Ethanol Price

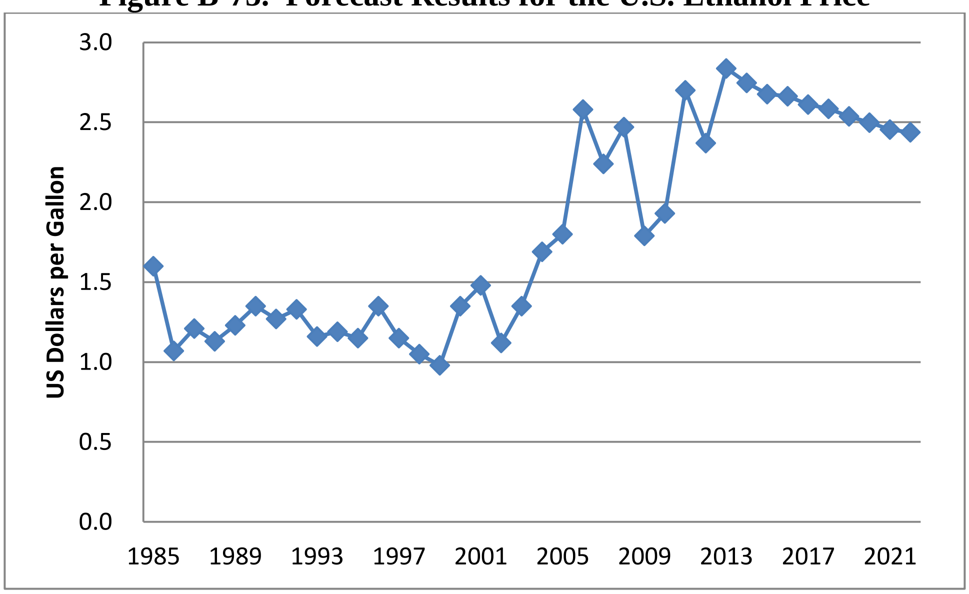


Figure B-76. Forecast Results for the U.S. Ethanol Total Production

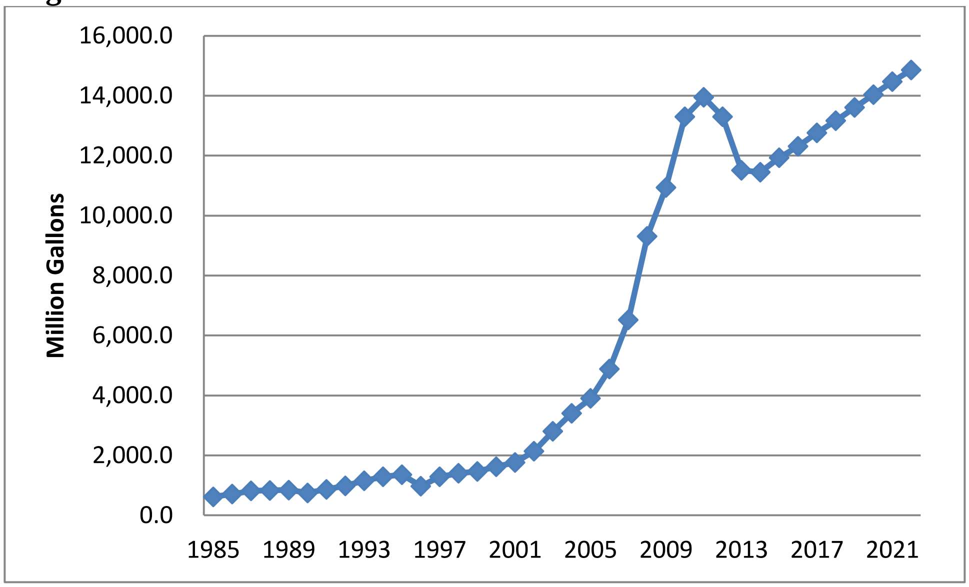
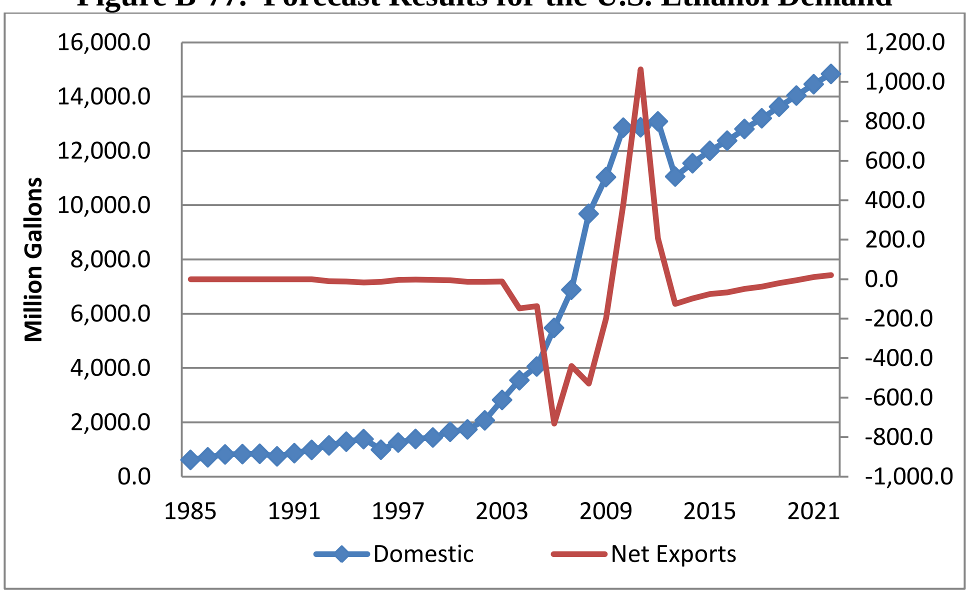


Figure B-77. Forecast Results for the U.S. Ethanol Demand



Note: 1) Left and right axis apply to domestic and net export demand.
2) Ending stocks are not presented in the figure.

Figure B-78. Forecast Results for the U.S. Ethanol Real Operating Margins

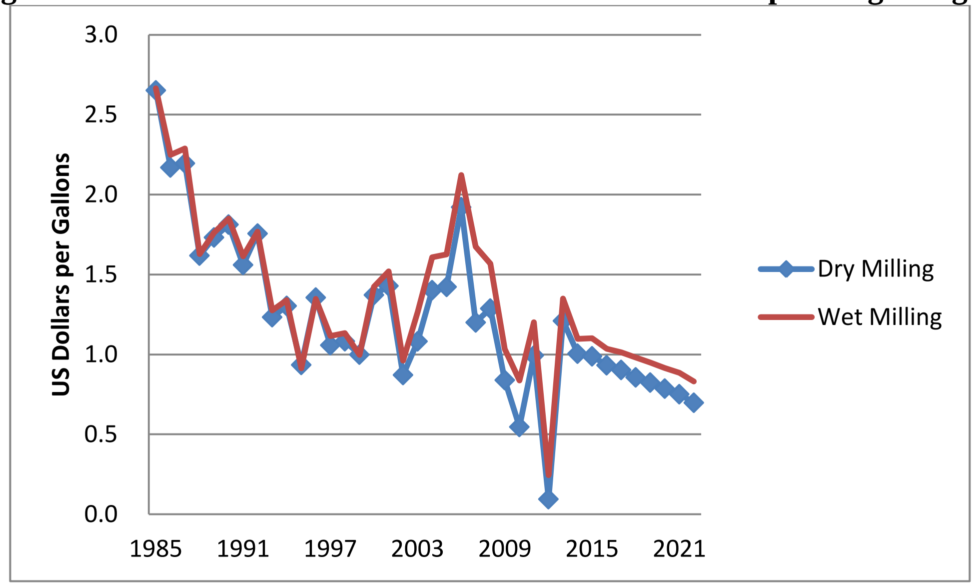


Figure B-79. Forecast Results for the U.S. Biodiesel Price

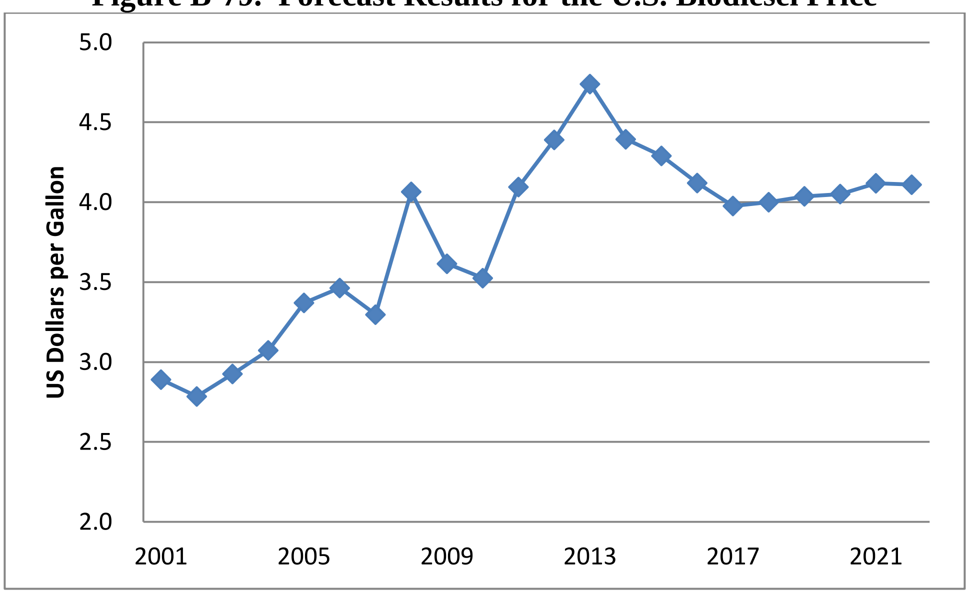


Figure B-80. Forecast Results for the U.S. Biodiesel Total Production

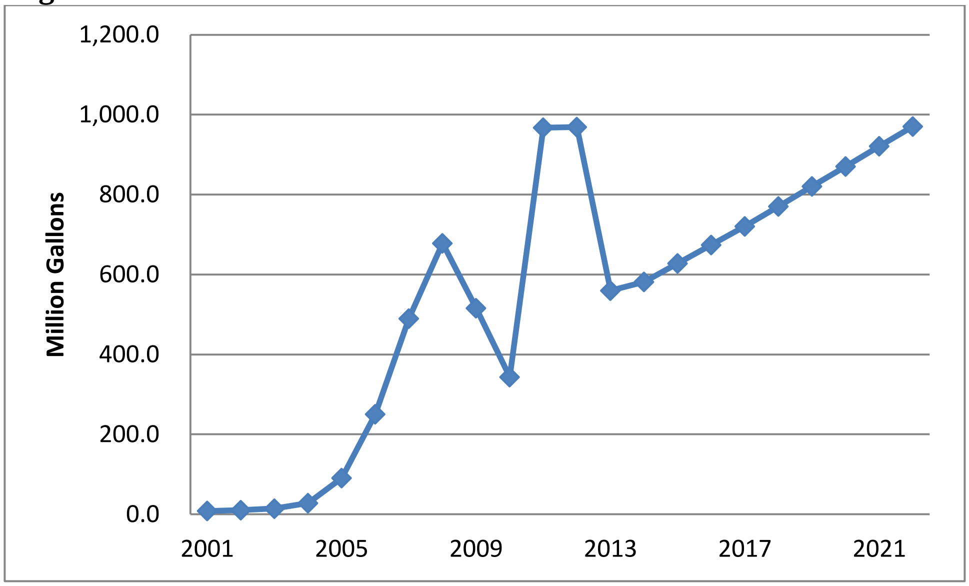
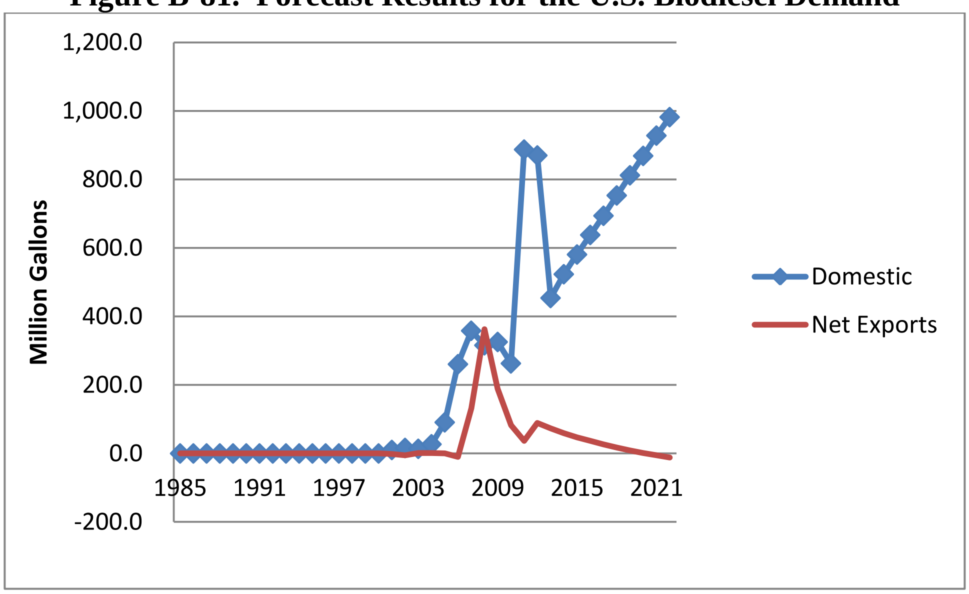


Figure B-81. Forecast Results for the U.S. Biodiesel Demand



Note: Ending stocks are not presented in the figure.

Figure B-82. Forecast Results for the U.S. Biodiesel Real Operating Margins

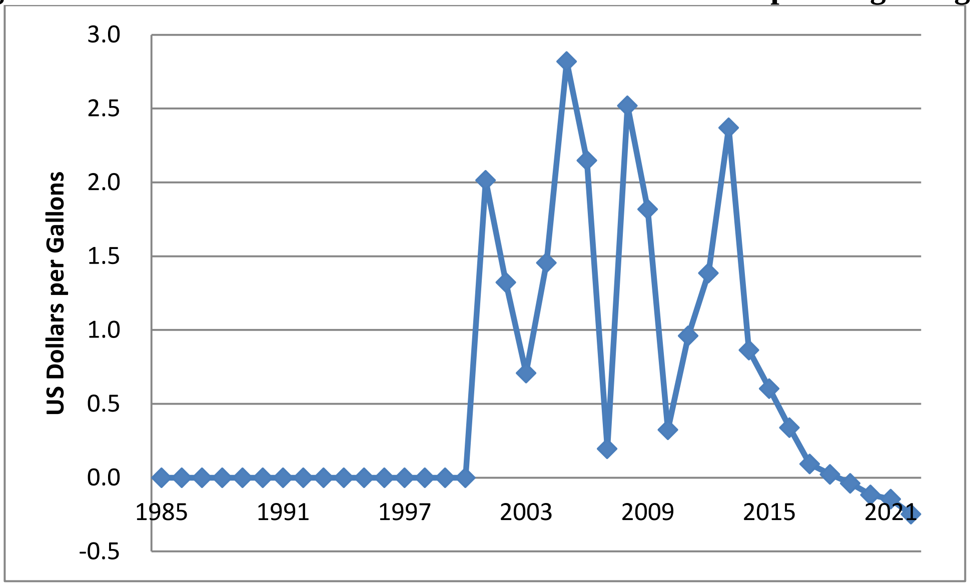


Figure B-83. Forecast Results for the U.S. Corn Price

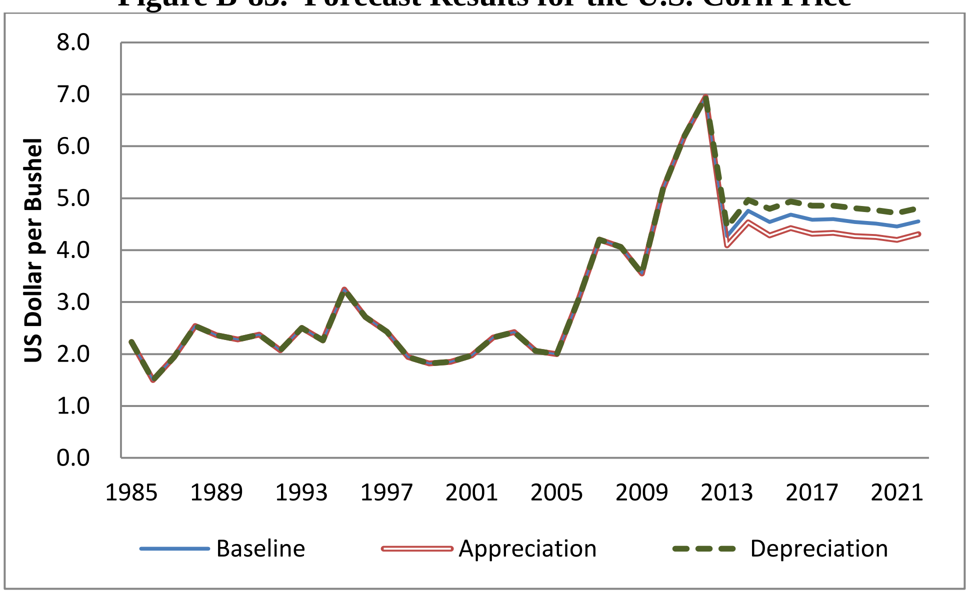


Figure B-84. Forecast Results for the U.S. Corn Total Planted Acres

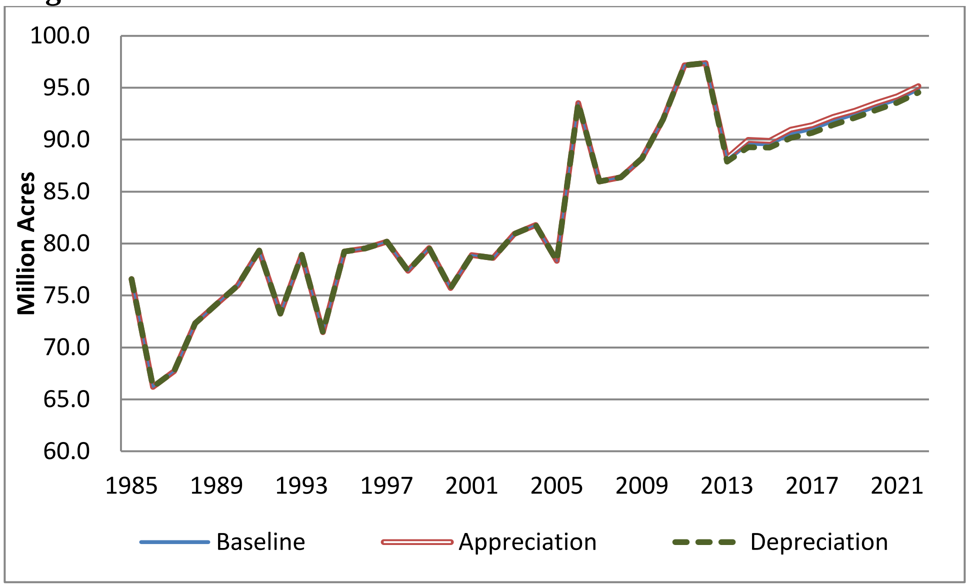


Figure B-85. Forecast Results for the U.S. Corn Total Production

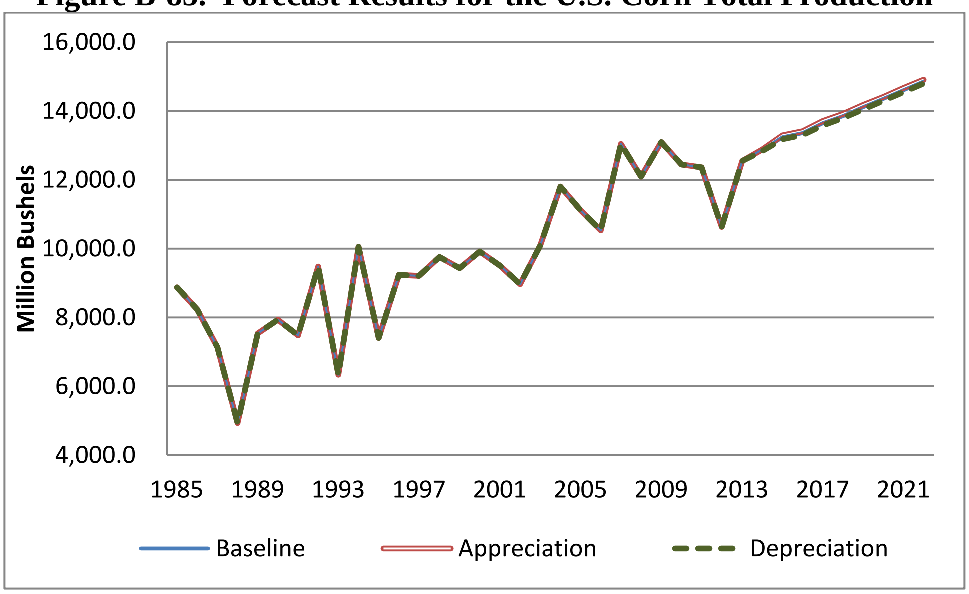
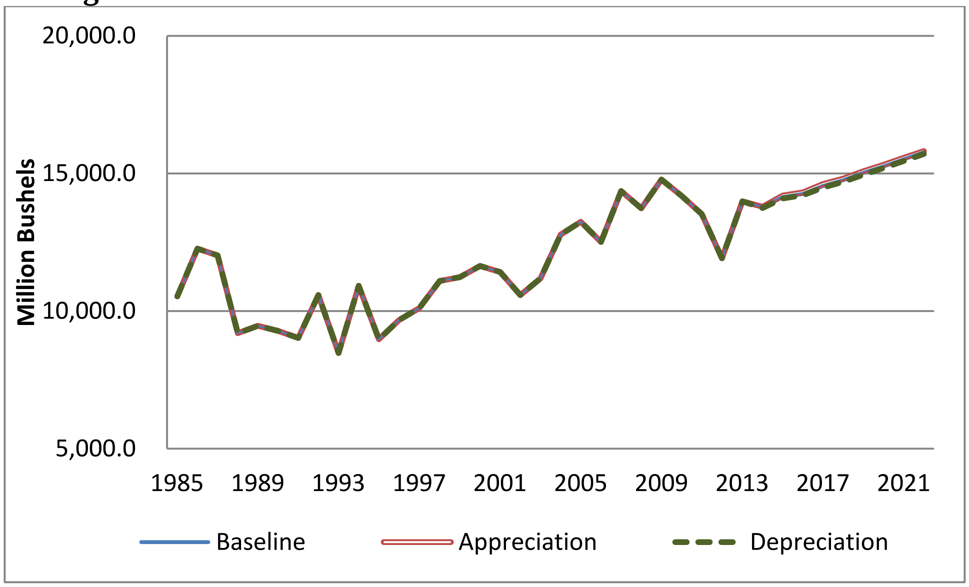


Figure B-86. Forecast Results for the U.S. Corn Total Demand



Note: Total demand includes seed, feed and residual, food and industrial, alcohol (energy), export demand, and ending stocks.

Figure B-87. Forecast Results for Regional Corn ENRs

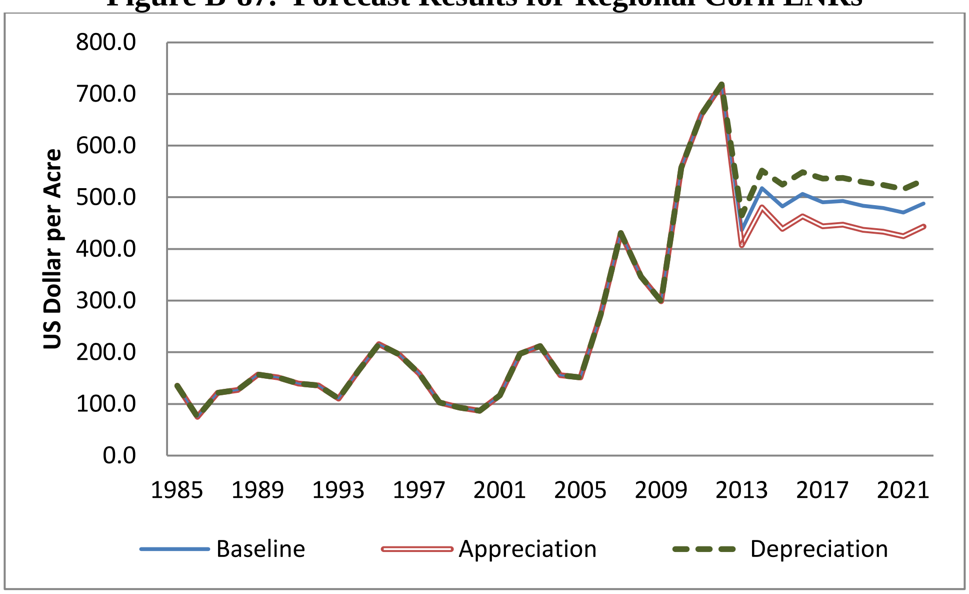


Figure B-88. Forecast Results for the U.S. Barley Price

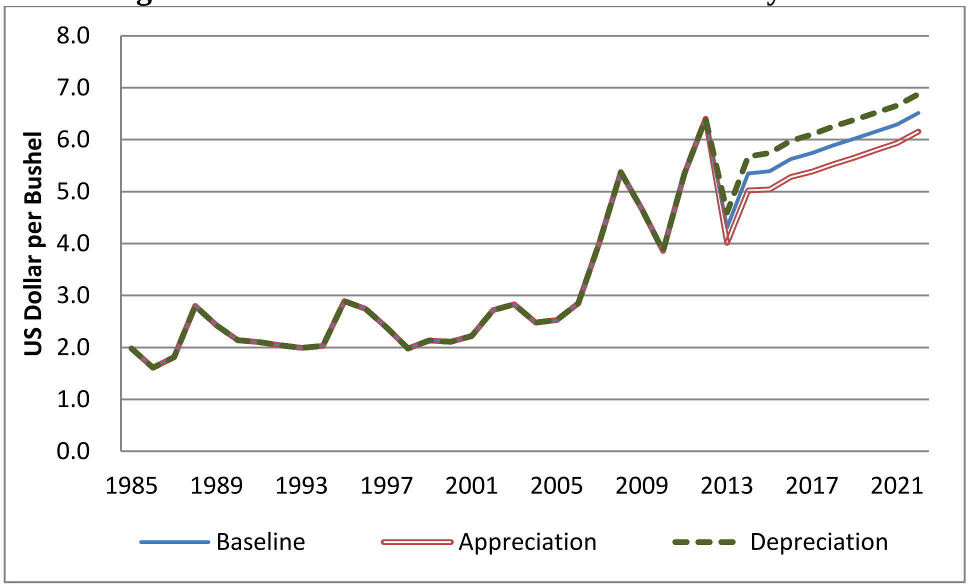


Figure B-89. Forecast Results for the U.S. Barley Total Planted Acres

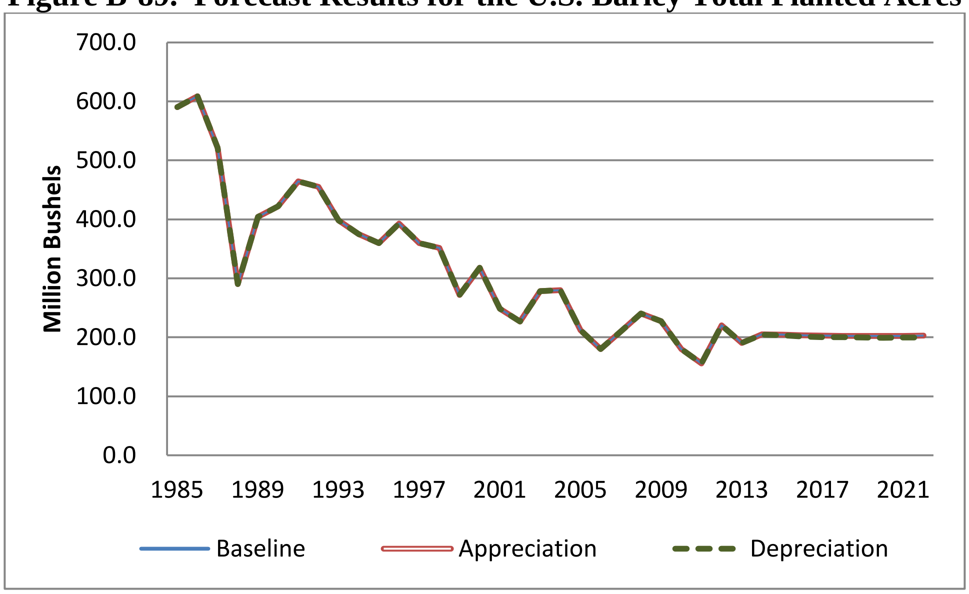


Figure B-90. Forecast Results for the U.S. Barley Total Production

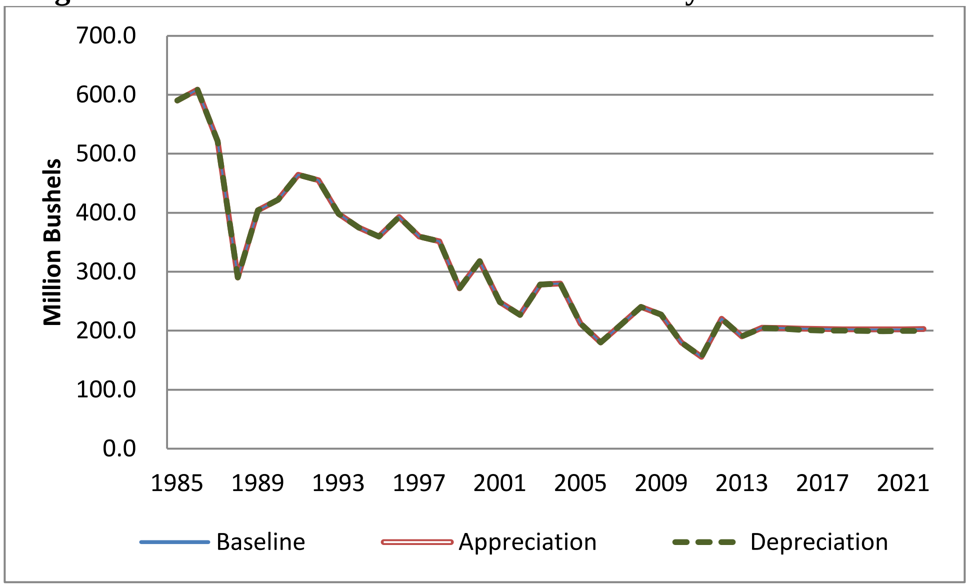
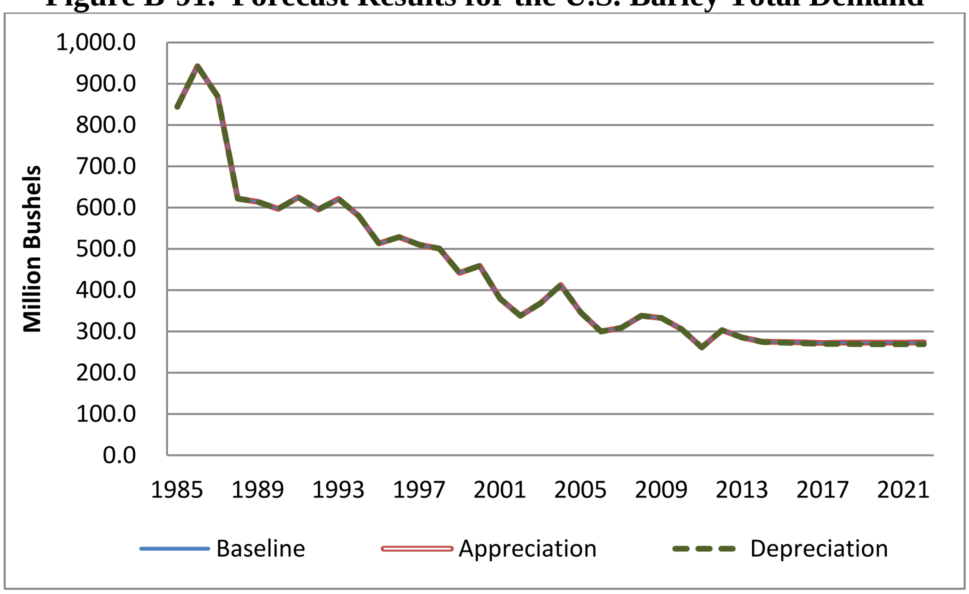


Figure B-91. Forecast Results for the U.S. Barley Total Demand



Note: Total demand includes seed, feed, food, export demand, and ending stocks.

Figure B-92. Forecast Results for Regional Barley ENRs

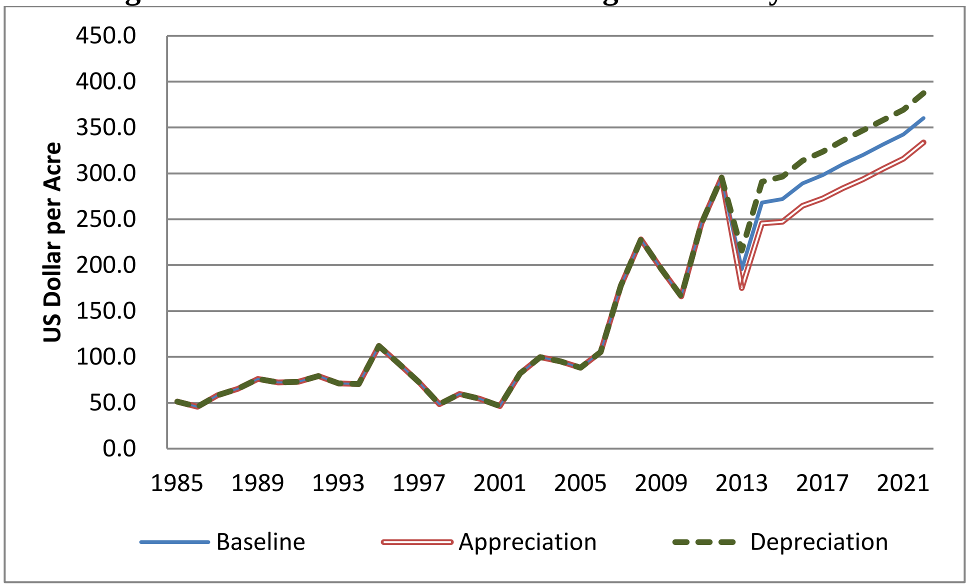


Figure B-93. Forecast Results for the U.S. Cotton Price

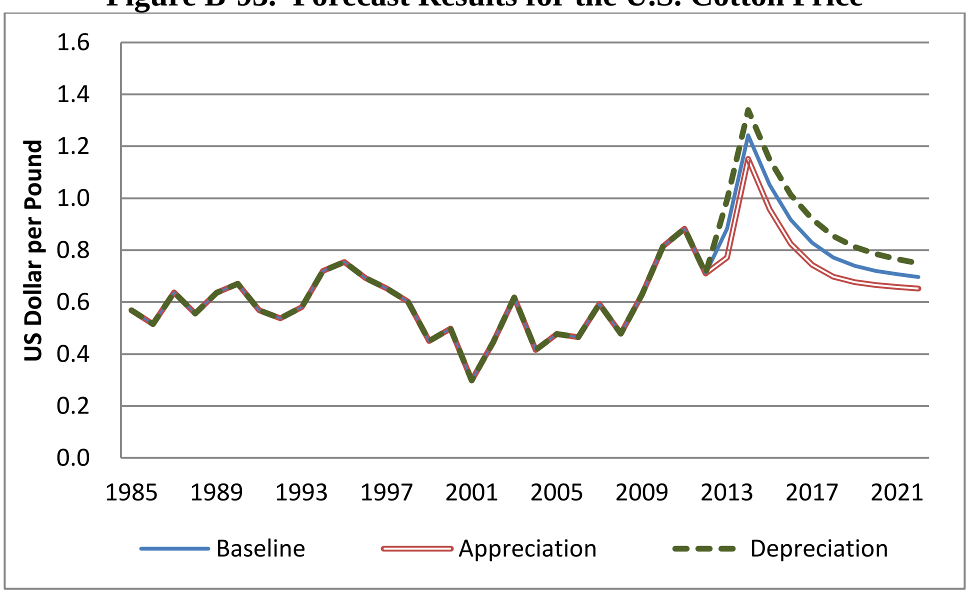


Figure B-94. Forecast Results for the U.S. Cotton Total Planted Acres

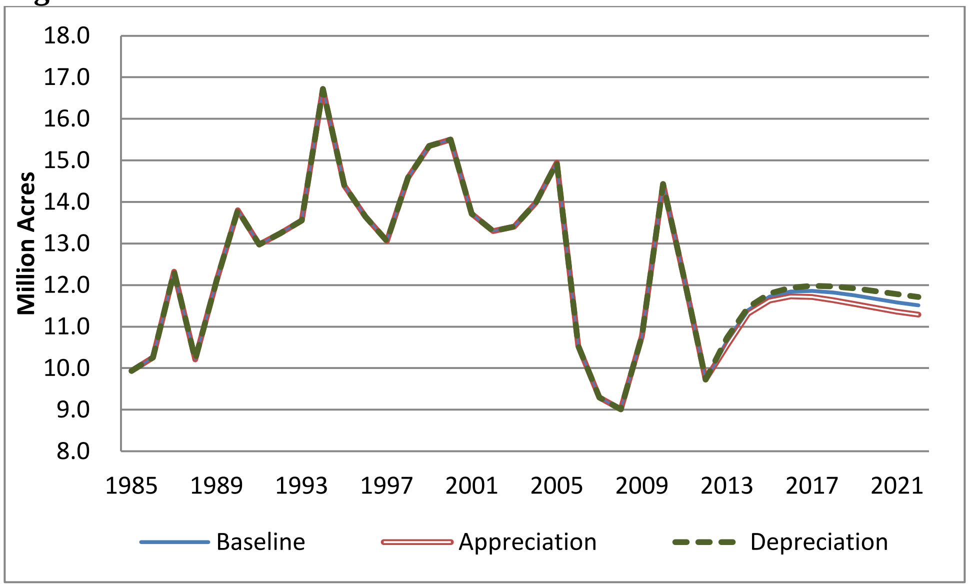


Figure B-95. Forecast Results for the U.S. Cotton Total Production

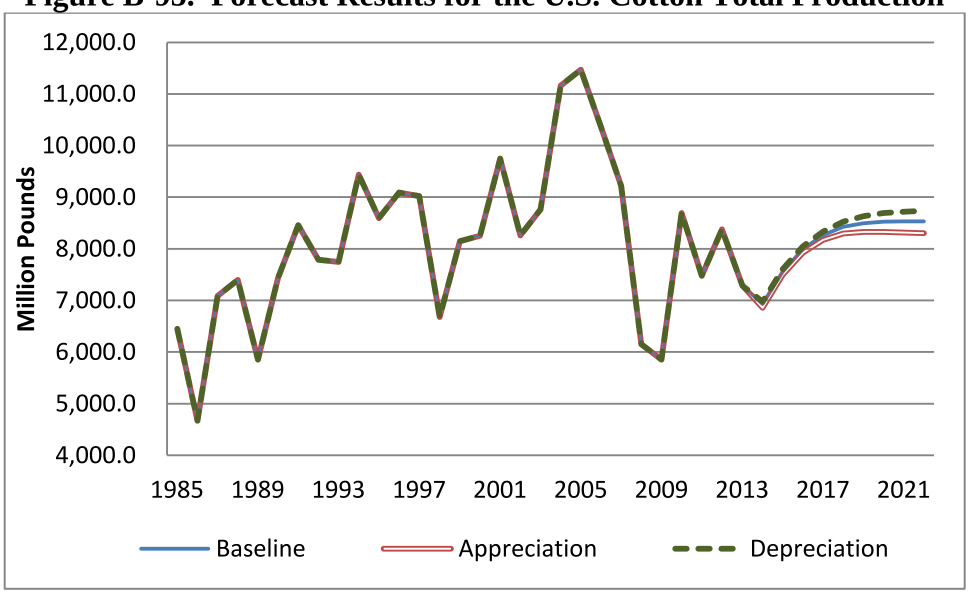
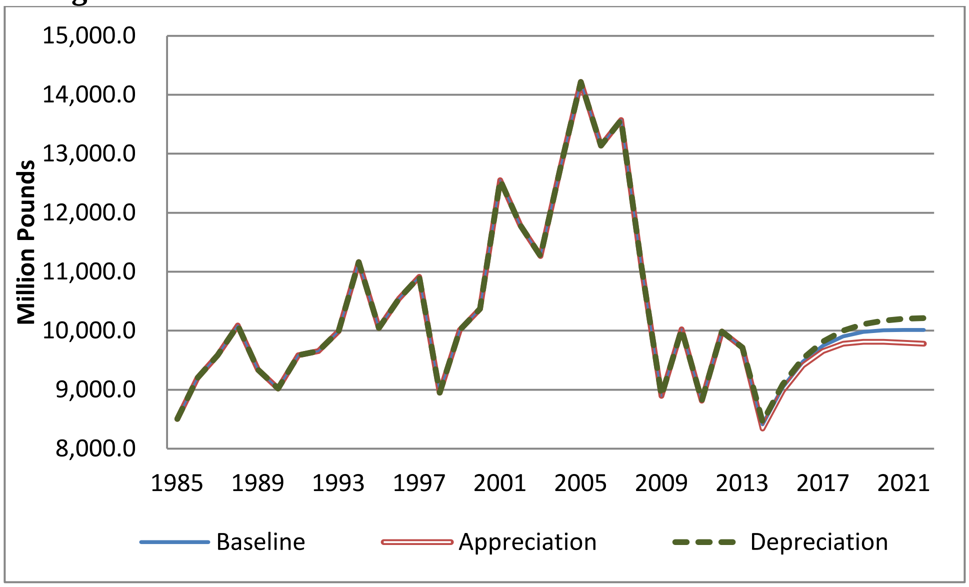


Figure B-96. Forecast Results for the U.S. Cotton Total Demand



Note: Total demand includes milling, export demand, and ending stocks.

Figure B-97. Forecast Results for Regional Cotton ENRs

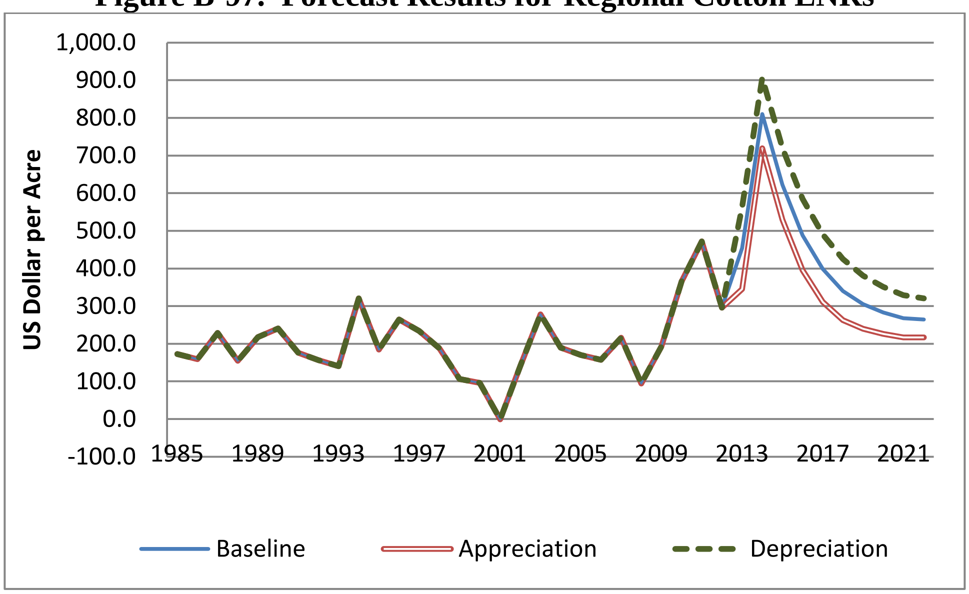


Figure B-98. Forecast Results for the U.S. Oat Price

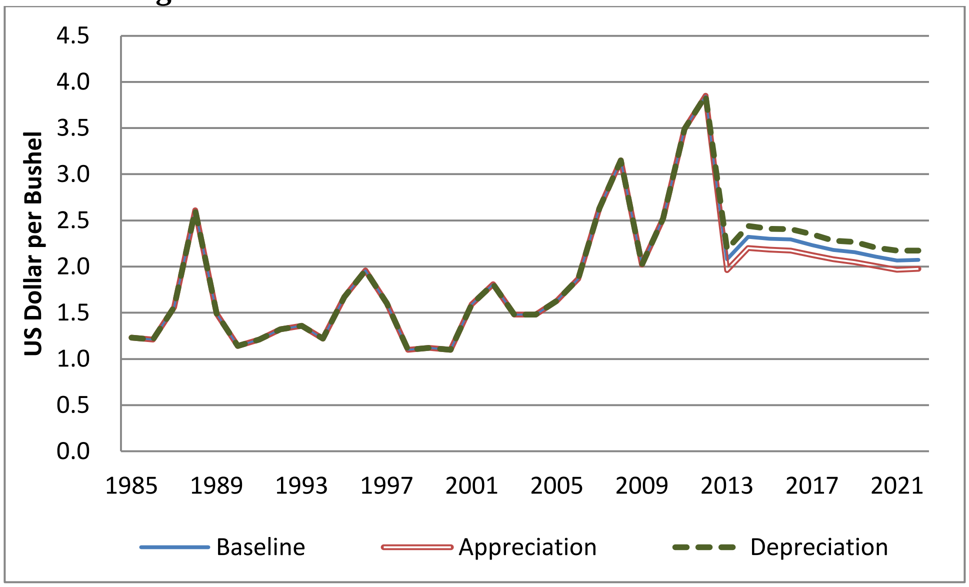


Figure B-99. Forecast Results for the U.S. Oat Total Planted Acres

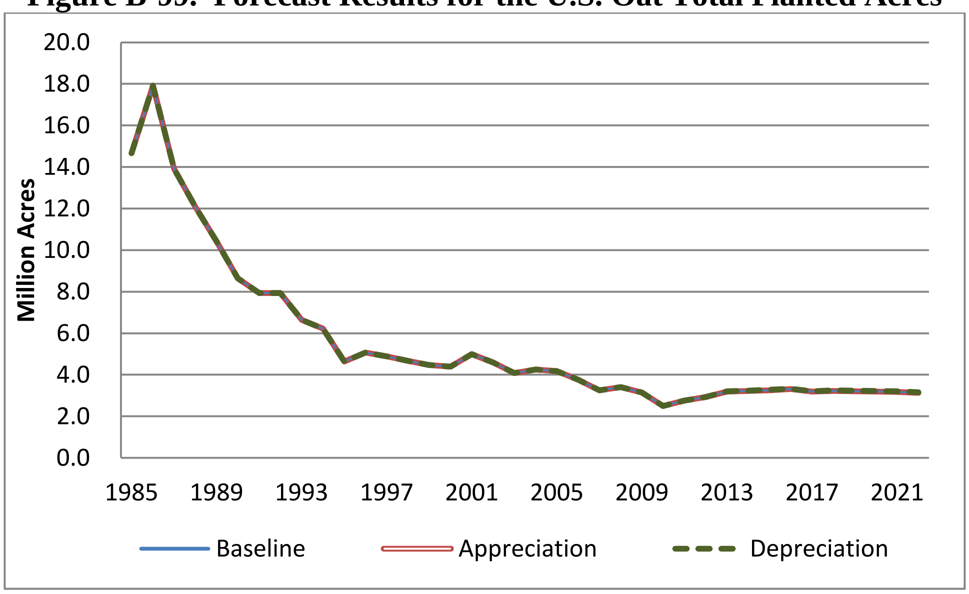


Figure B-100. Forecast Results for the U.S. Oat Total Production

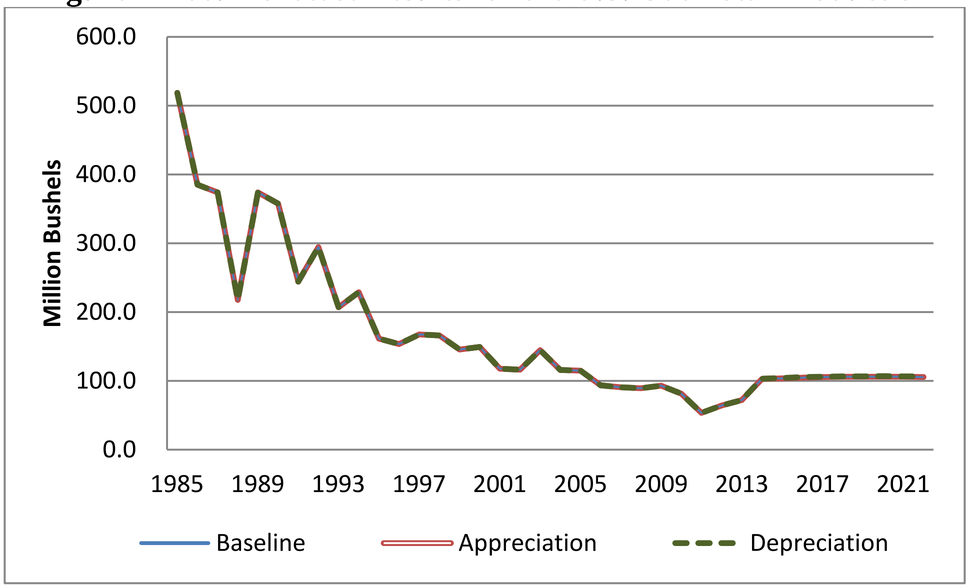
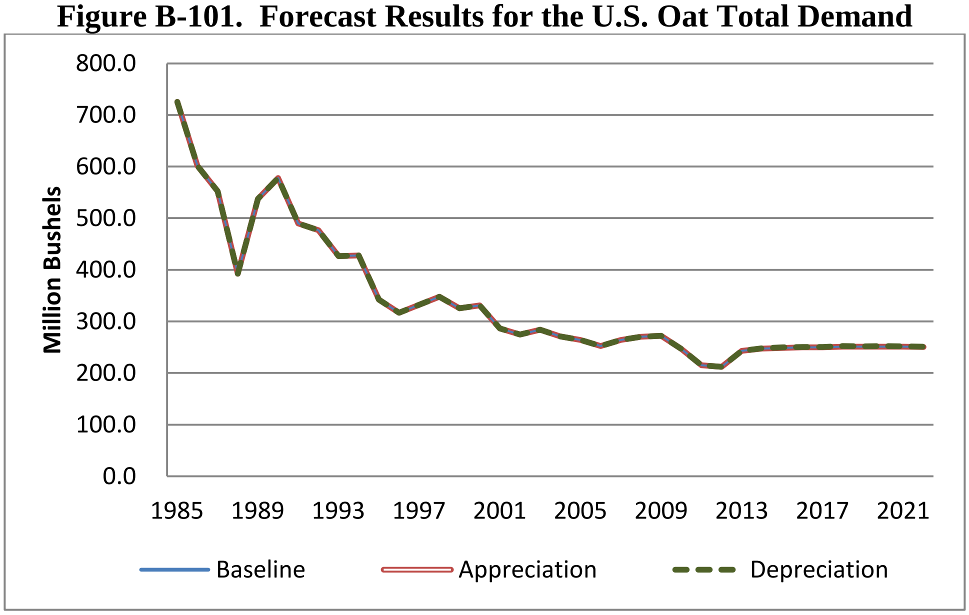


Figure B-101. Forecast Results for the U.S. Oat Total Demand



Note: Total demand includes seed, feed, food, export demand, and ending stocks.

Figure B-102. Forecast Results for Regional Oat ENRs

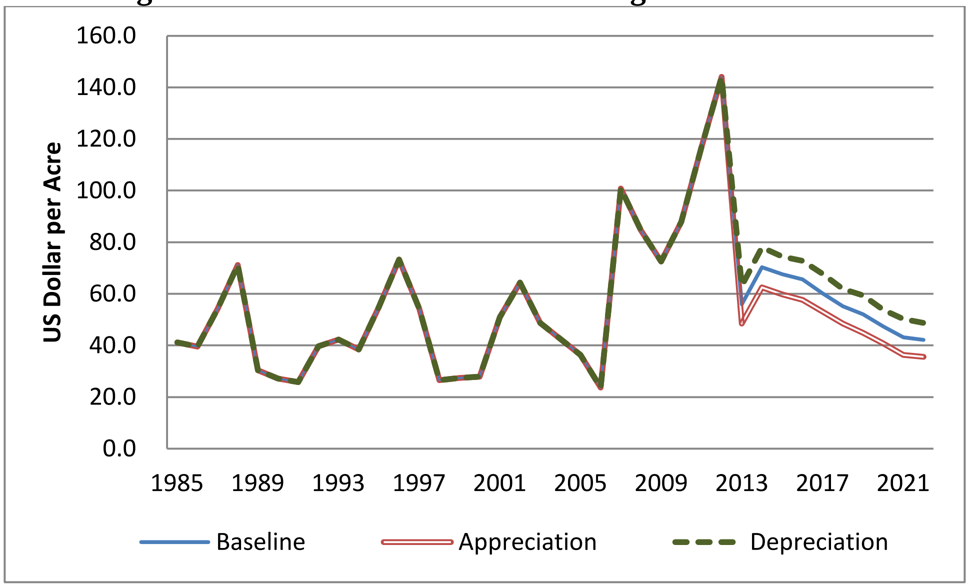


Figure B-103. Forecast Results for the U.S. LG Rice Price

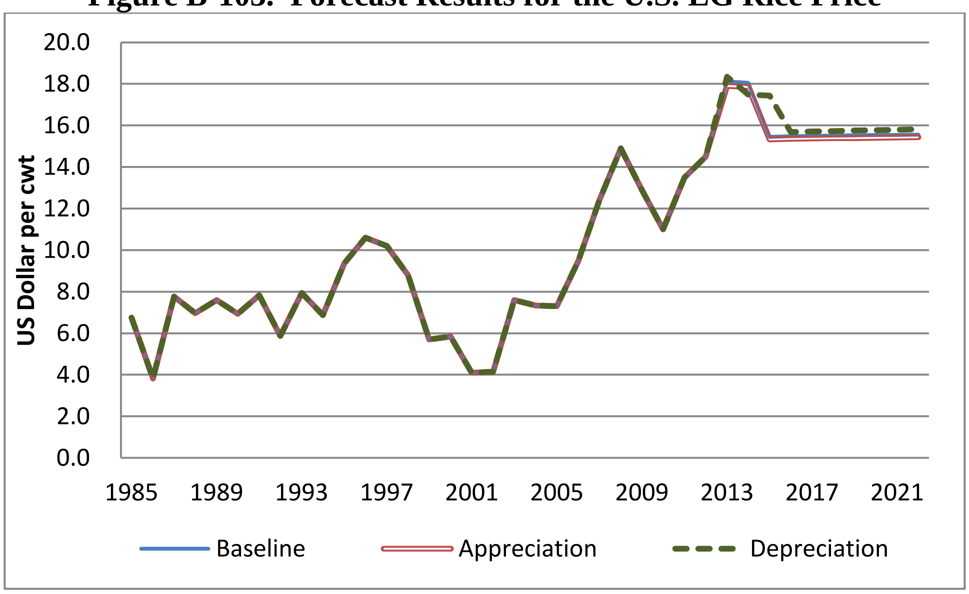


Figure B-104. Forecast Results for the U.S. LG Rice Total Planted Acres

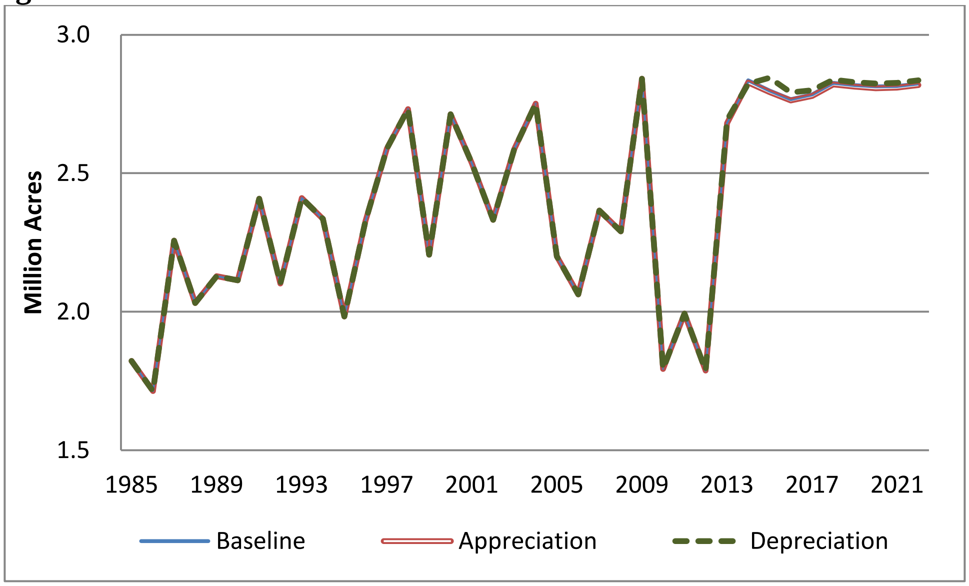


Figure B-105. Forecast Results for the U.S. LG Rice Total Production

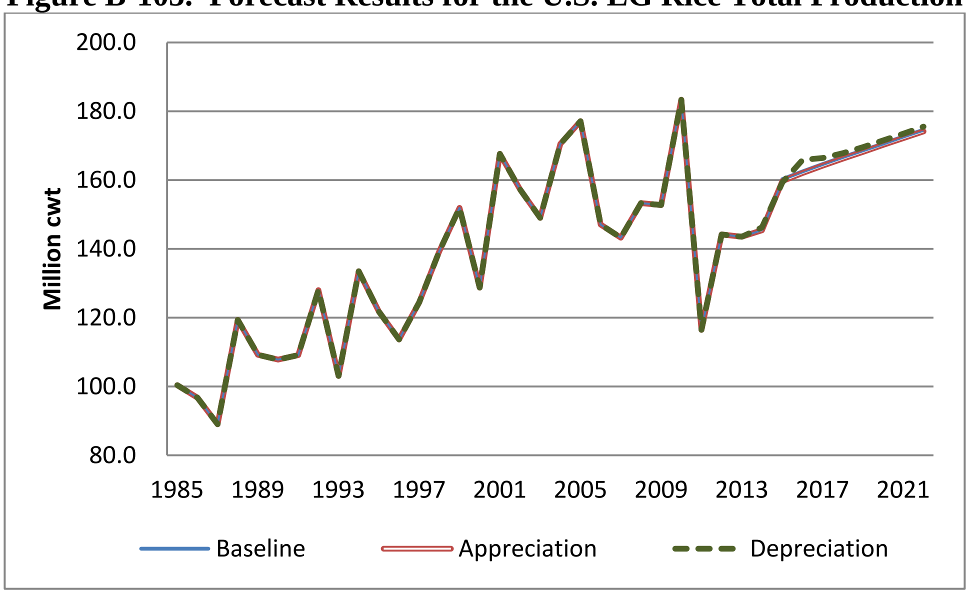
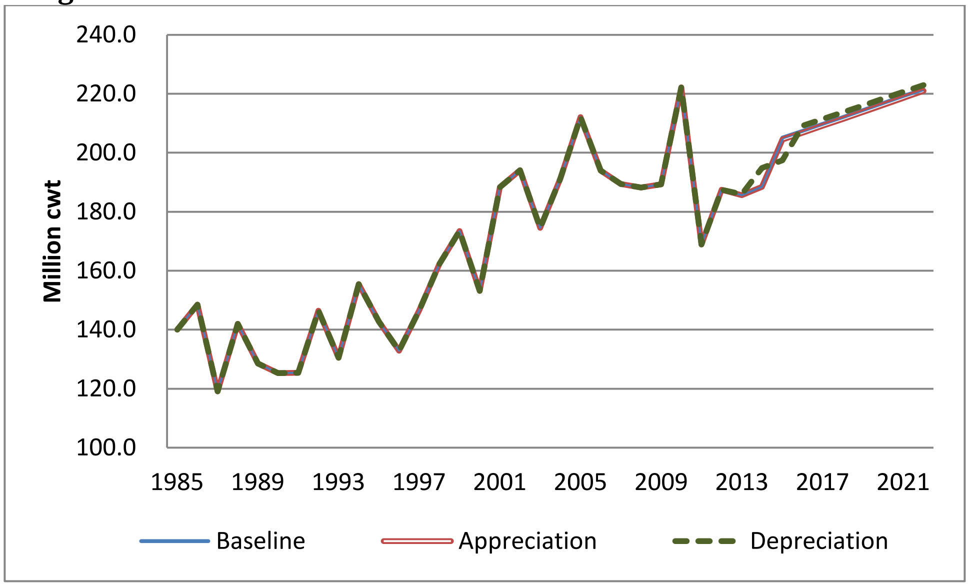


Figure B-106. Forecast Results for the U.S. LG rice Total Demand



Note: Total demand includes domestic and residual, export demand, and ending stocks.

Figure B-107. Forecast Results for Regional LG Rice ENRs

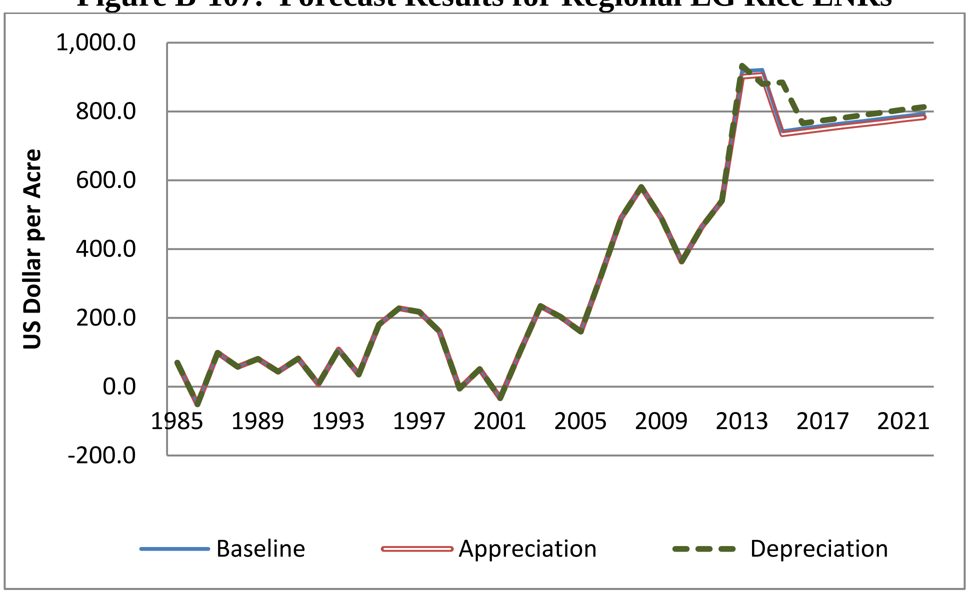


Figure B-108. Forecast Results for the U.S. MSG Rice Price

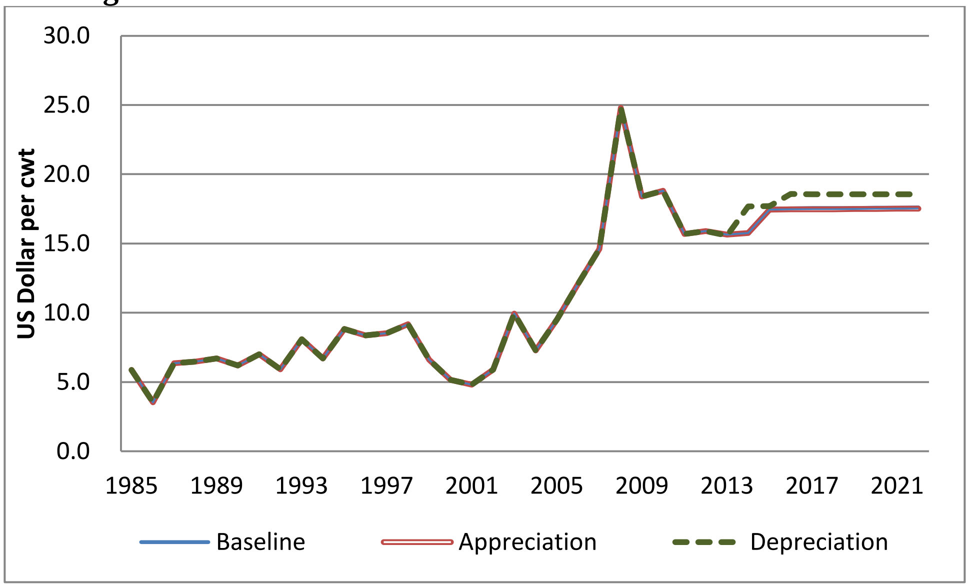


Figure B-109. Forecast Results for the U.S. MSG Rice Total Planted Acres

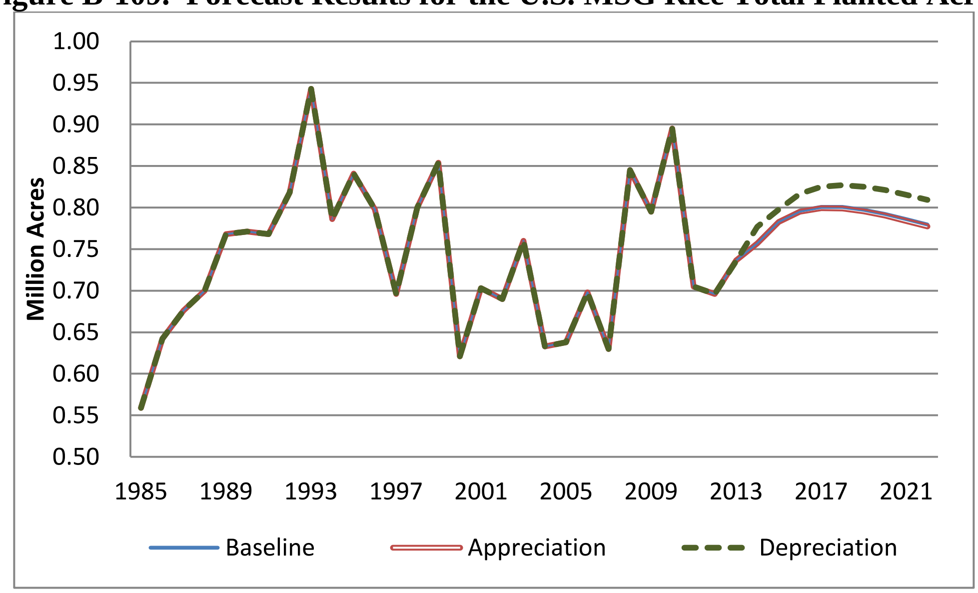


Figure B-110. Forecast Results for the U.S. MSG Rice Total Production

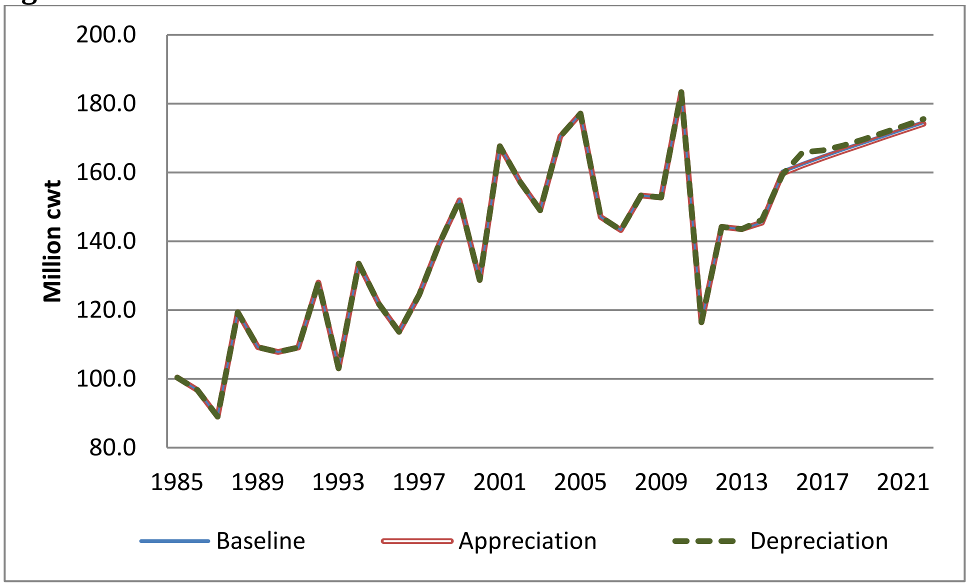
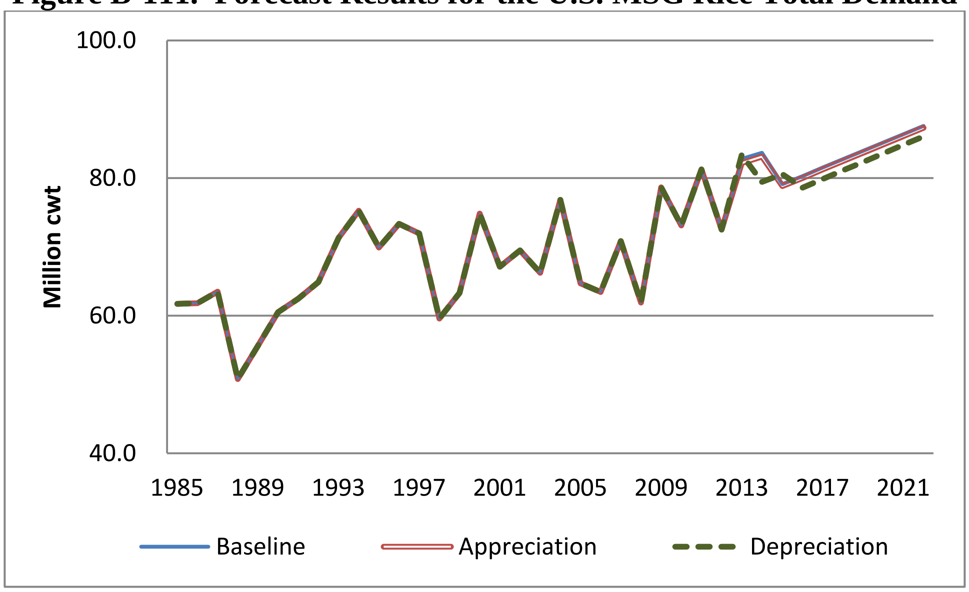


Figure B-111. Forecast Results for the U.S. MSG Rice Total Demand



Note: Total demand includes domestic and residual, export demand, and ending stocks.

Figure B-112. Forecast Results for Regional MSG Rice ENRs

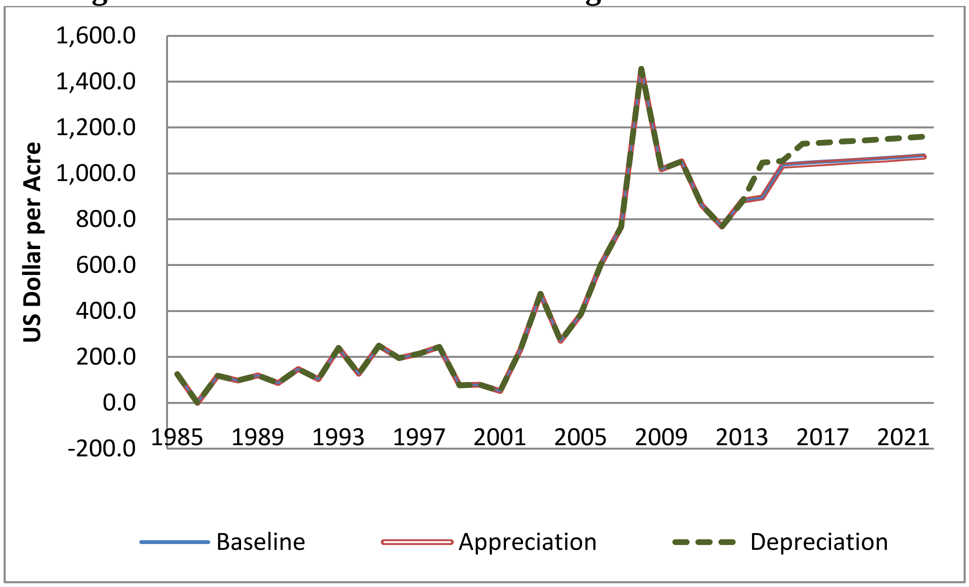


Figure B-113. Forecast Results for the U.S. Sorghum Price

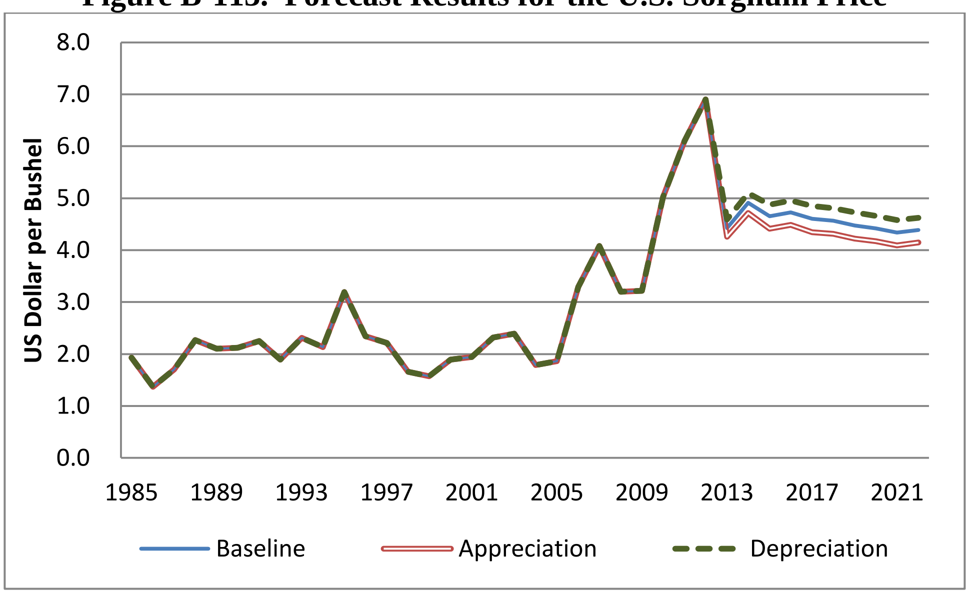


Figure B-114. Forecast Results for the U.S. Sorghum Total Planted Acres

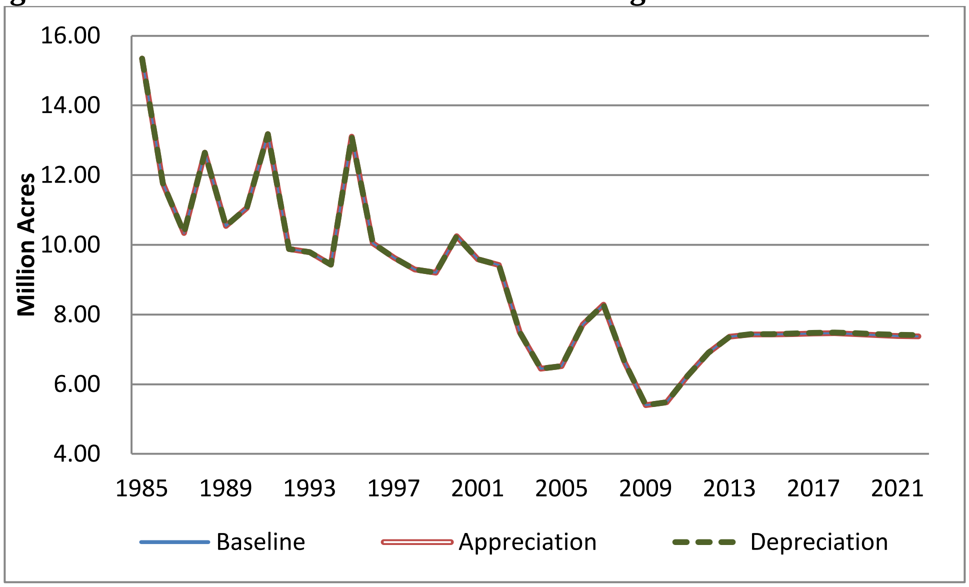


Figure B-115. Forecast Results for the U.S. Sorghum Total Production

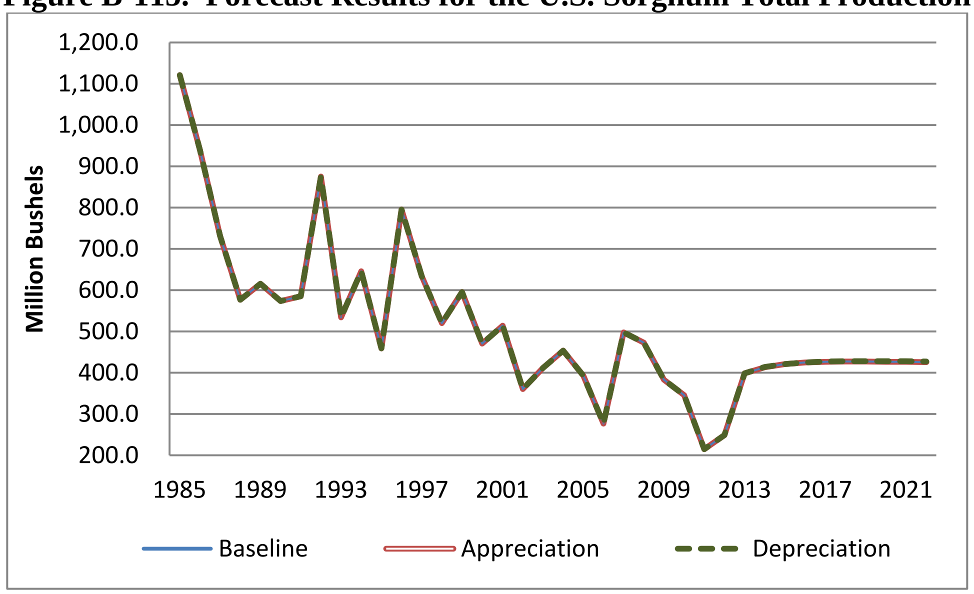
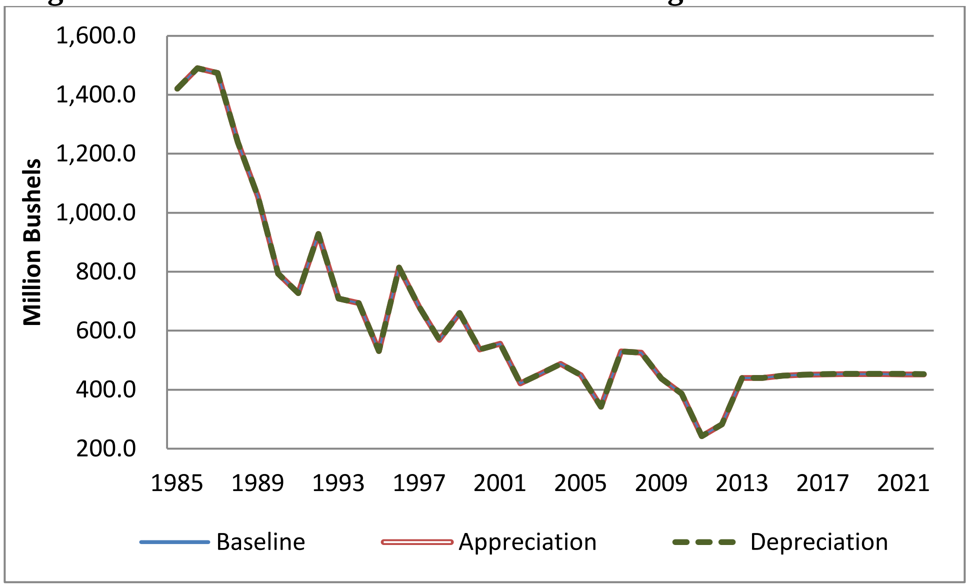


Figure B-116. Forecast Results for the U.S. Sorghum Total Demand



Note: Total demand includes seed, feed, food, export demand, and ending stocks.

Figure B-117. Forecast Results for Regional Sorghum ENRs

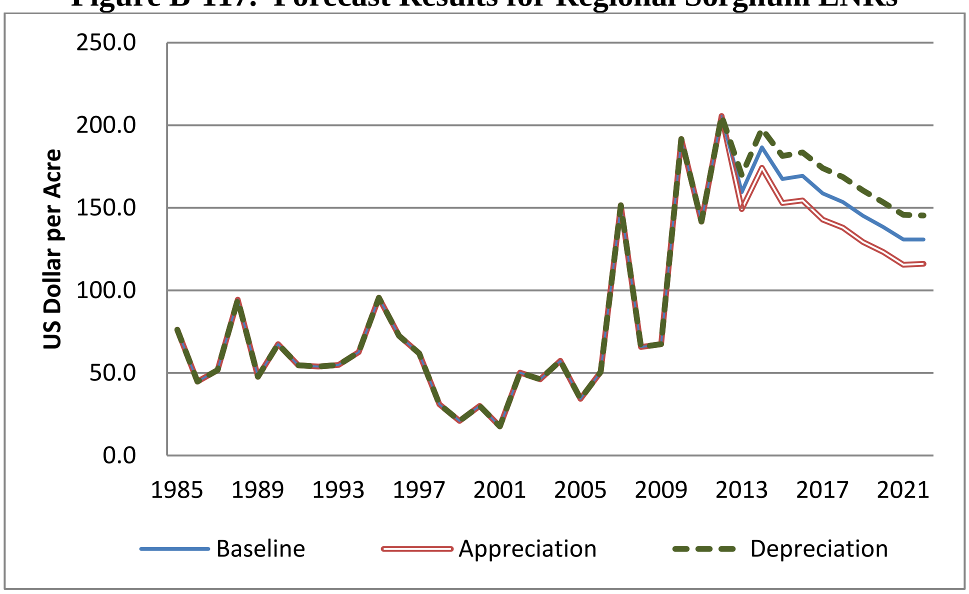


Figure B-118. Forecast Results for the U.S. Soybean Price

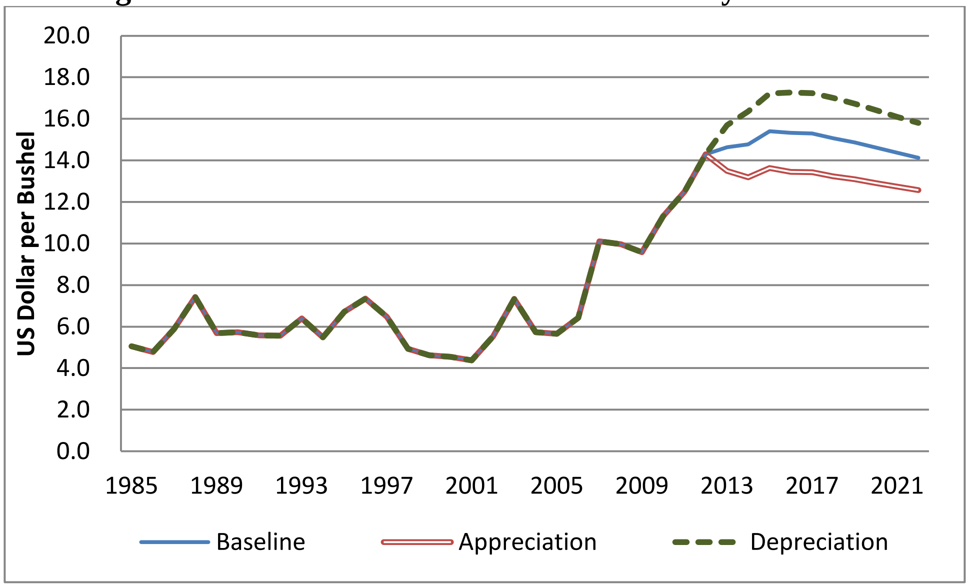


Figure B-119. Forecast Results for the U.S. Soybean Total Planted Acres

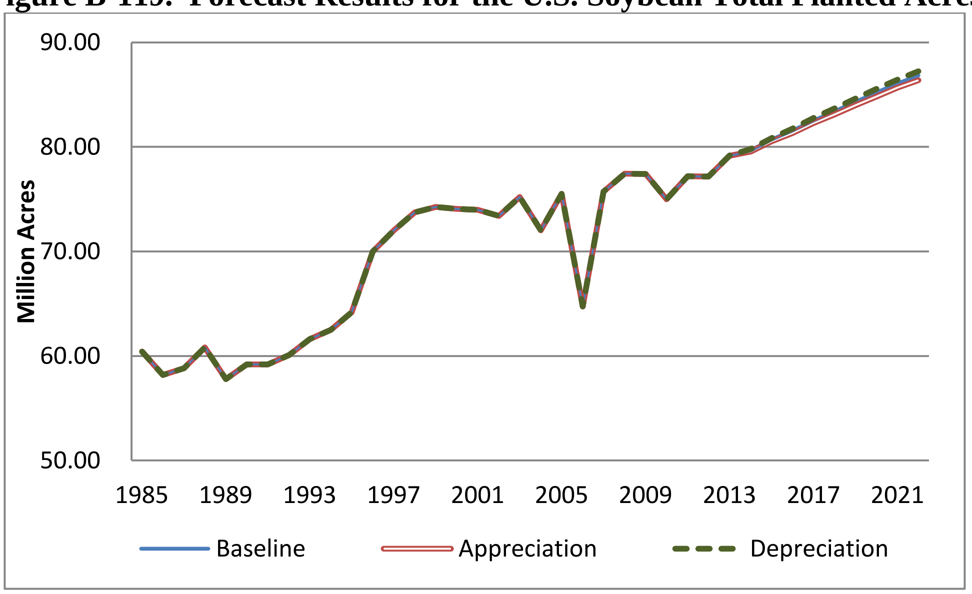


Figure B-120. Forecast Results for the U.S. Soybean Total Production

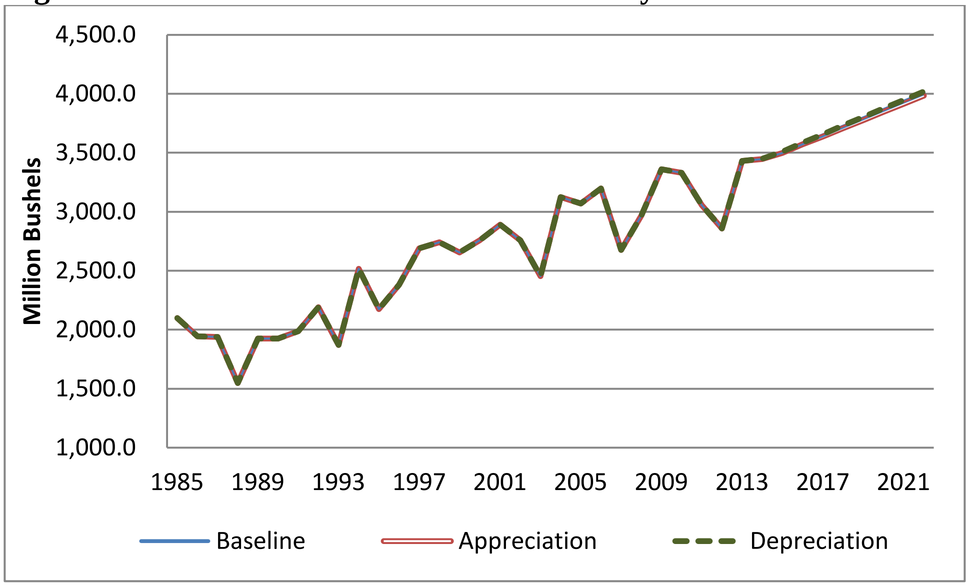
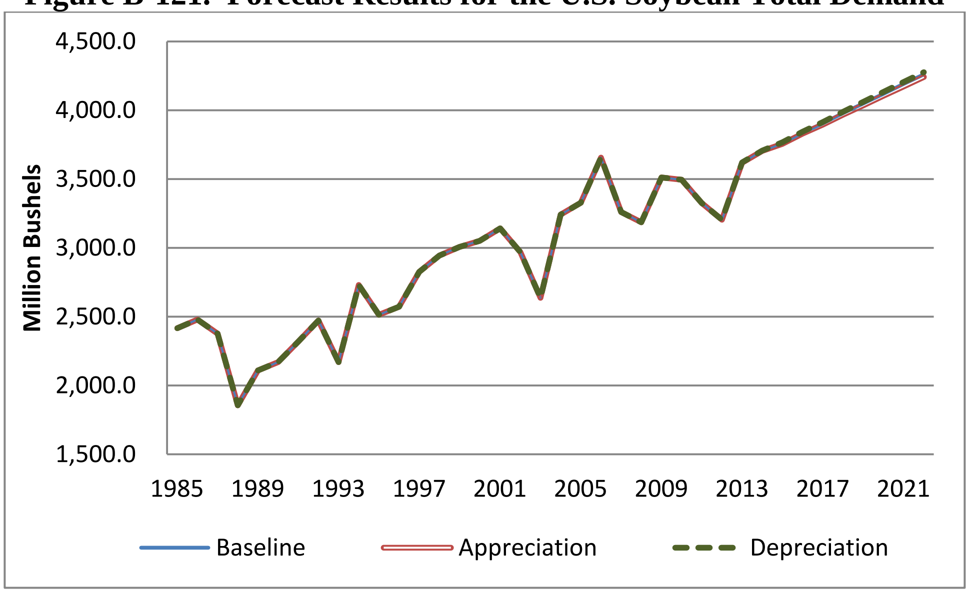


Figure B-121. Forecast Results for the U.S. Soybean Total Demand



Note: Total demand includes seed, feed, and residual, crushing, export demand, and ending stocks.

Figure B-122. Forecast Results for Regional Soybean ENRs

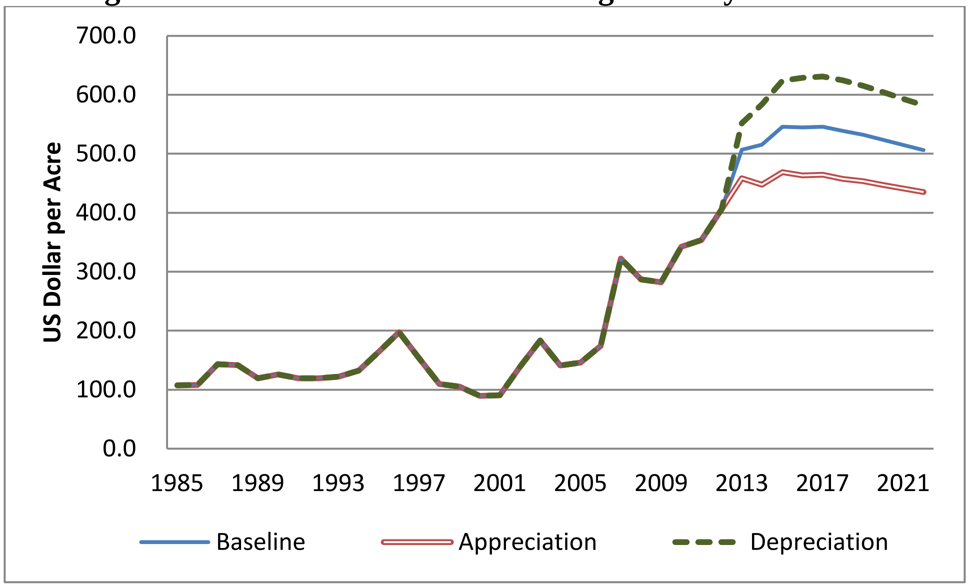


Figure B-123. Forecast Results for the U.S. Soybean Meal Price

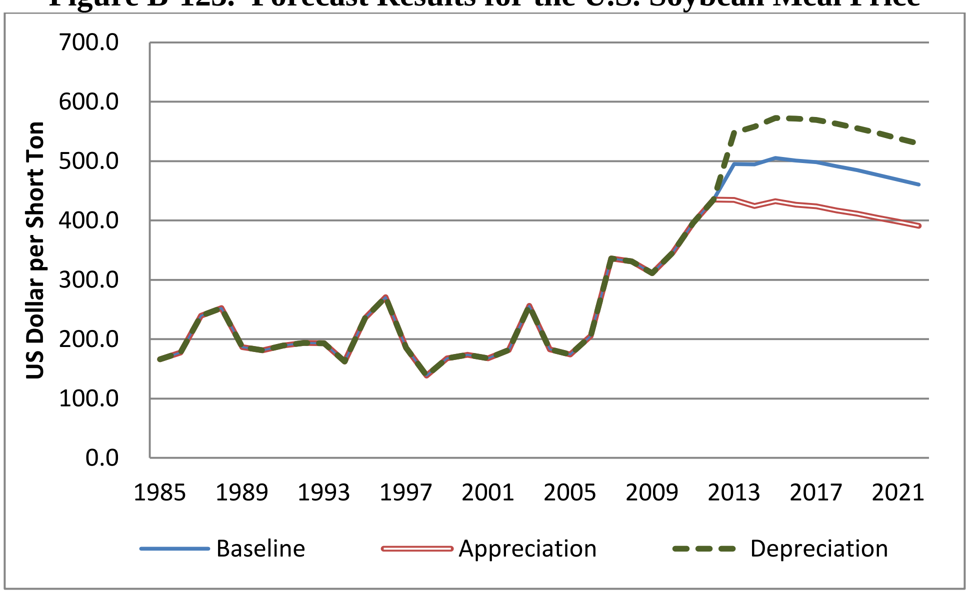


Figure B-124. Forecast Results for the U.S. Soybean Meal Total Production

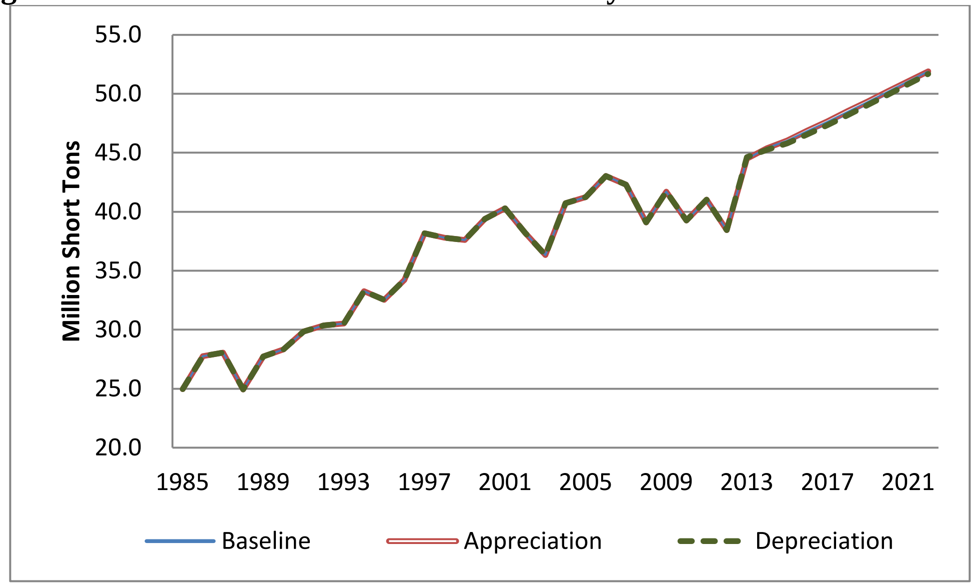
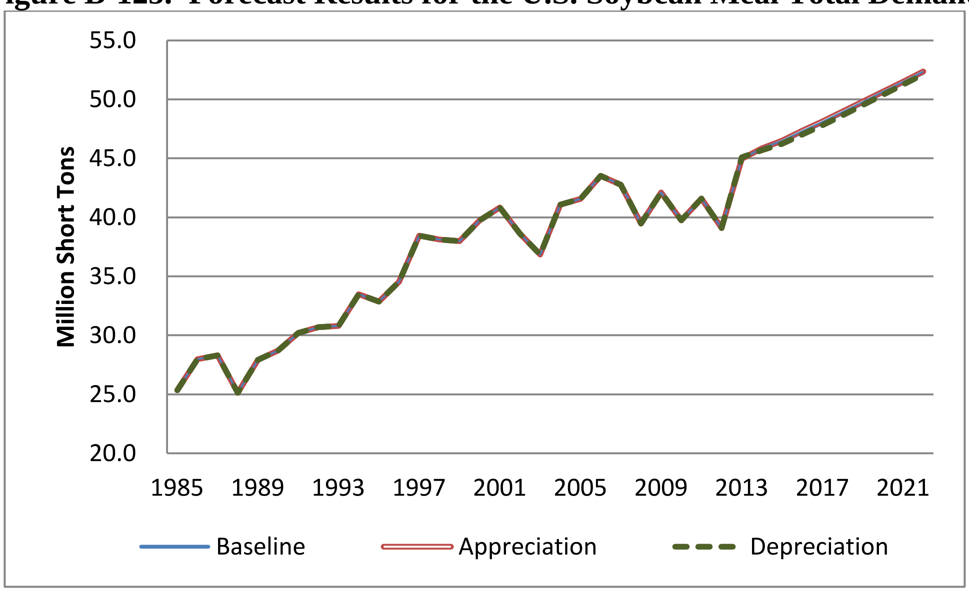


Figure B-125. Forecast Results for the U.S. Soybean Meal Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-126. Forecast Results for the U.S. Soybean Oil Price

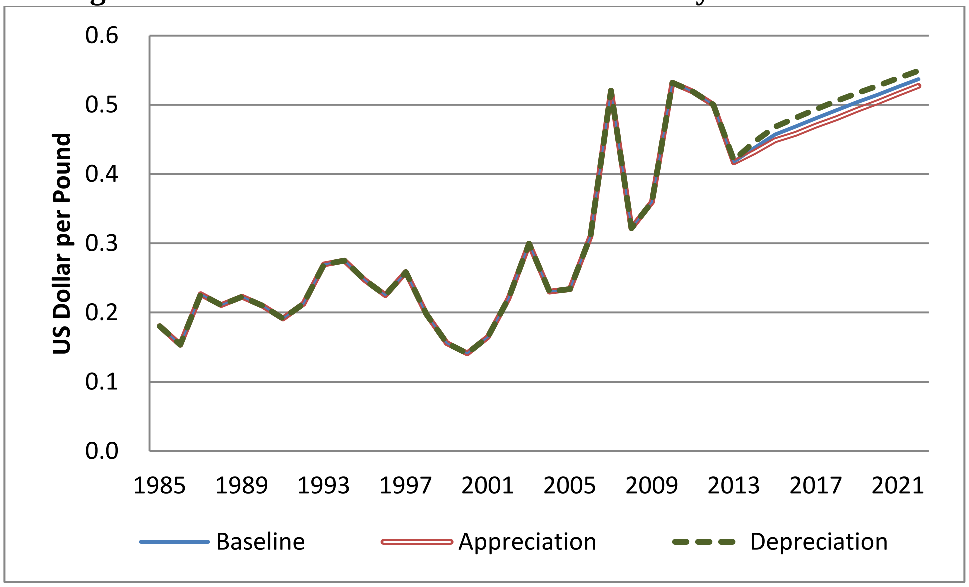


Figure B-127. Forecast Results for the U.S. Soybean Oil Total Production

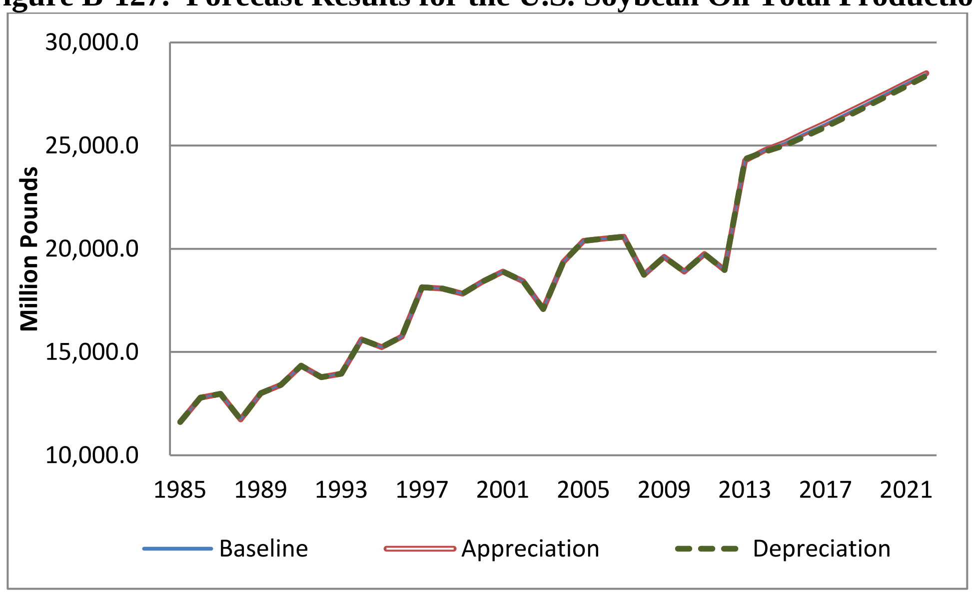
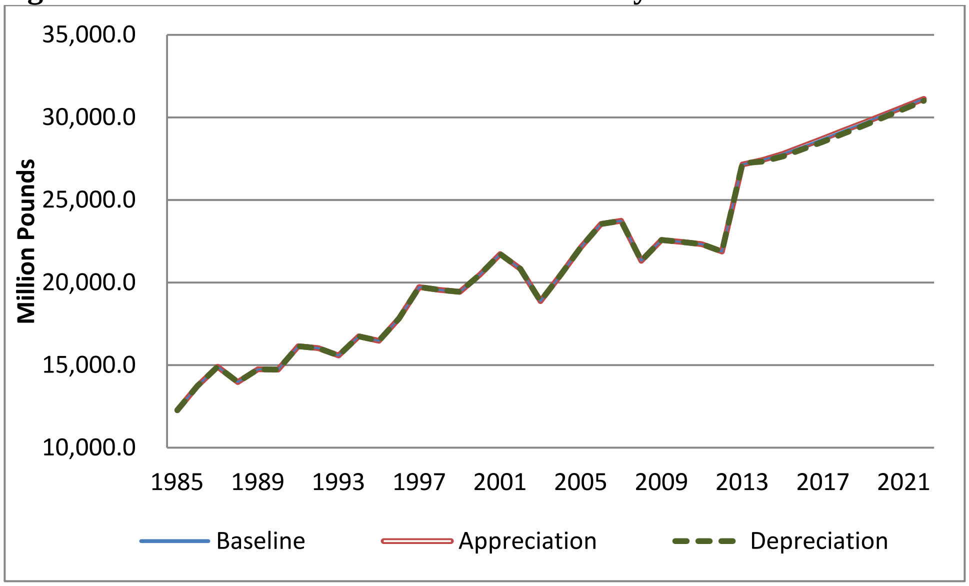


Figure B-128. Forecast Results for the U.S. Soybean Oil Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-129. Forecast Results for the U.S. Wheat Price

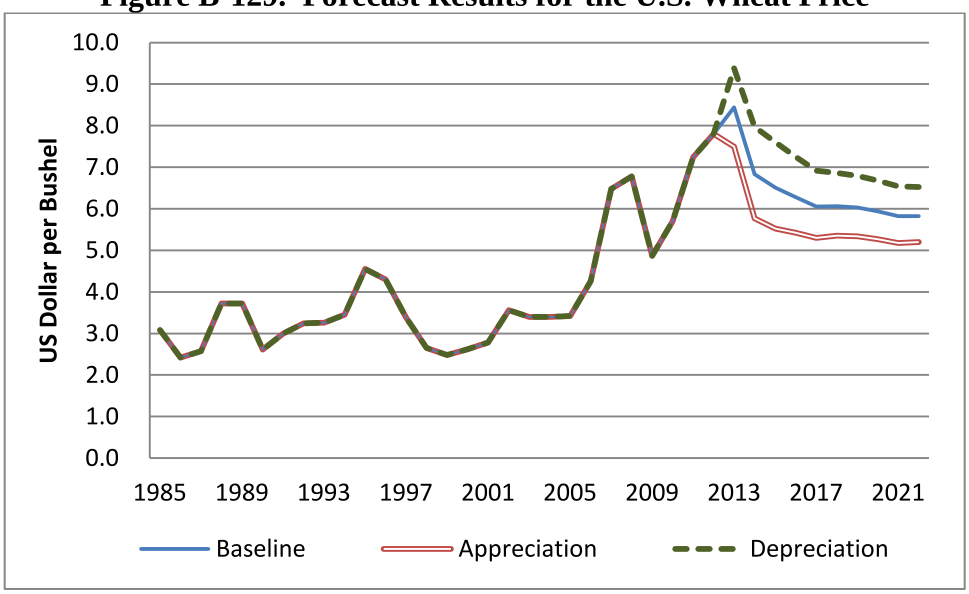


Figure B-130. Forecast Results for the U.S. Wheat Total Planted Acres

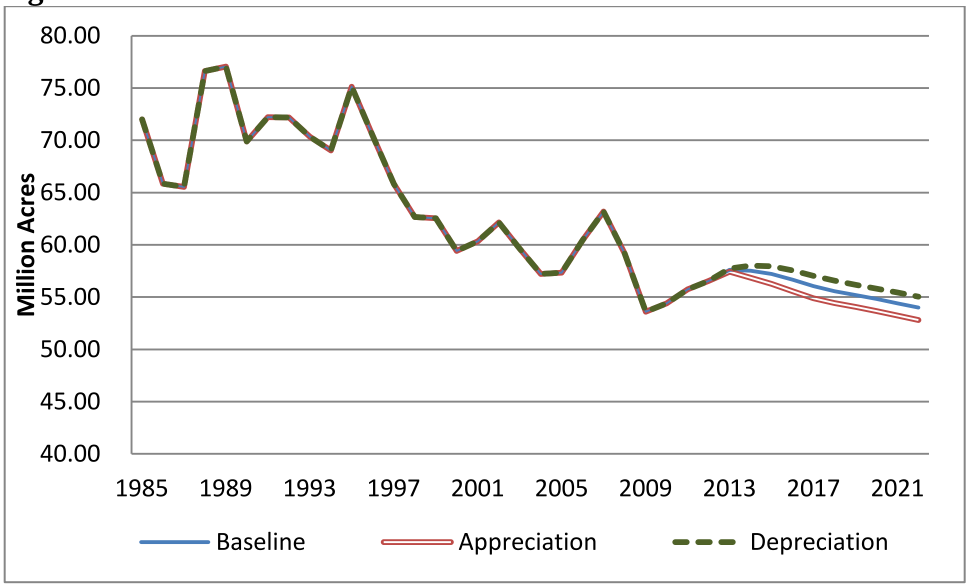


Figure B-131. Forecast Results for the U.S. Wheat Total Production

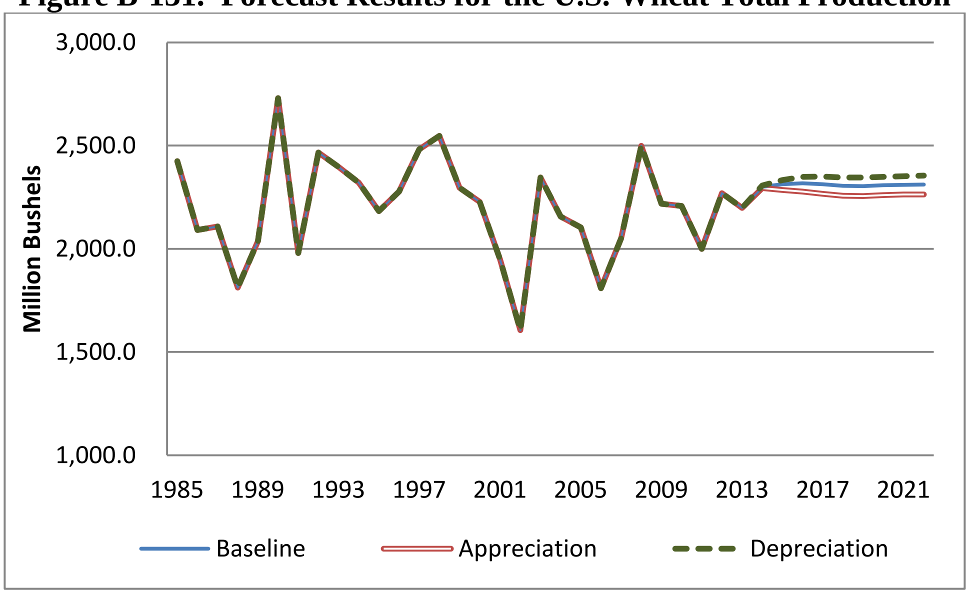
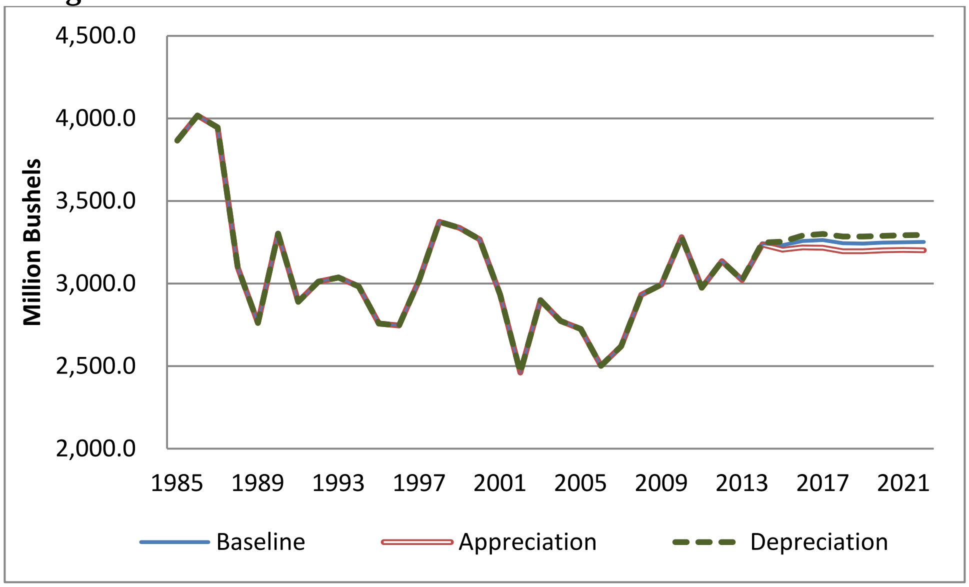


Figure B-132. Forecast Results for the U.S. Wheat Total Demand



Note: Total demand includes seed, feed and residual, food, export demand.

Figure B-133. Forecast Results for Regional Wheat ENRs

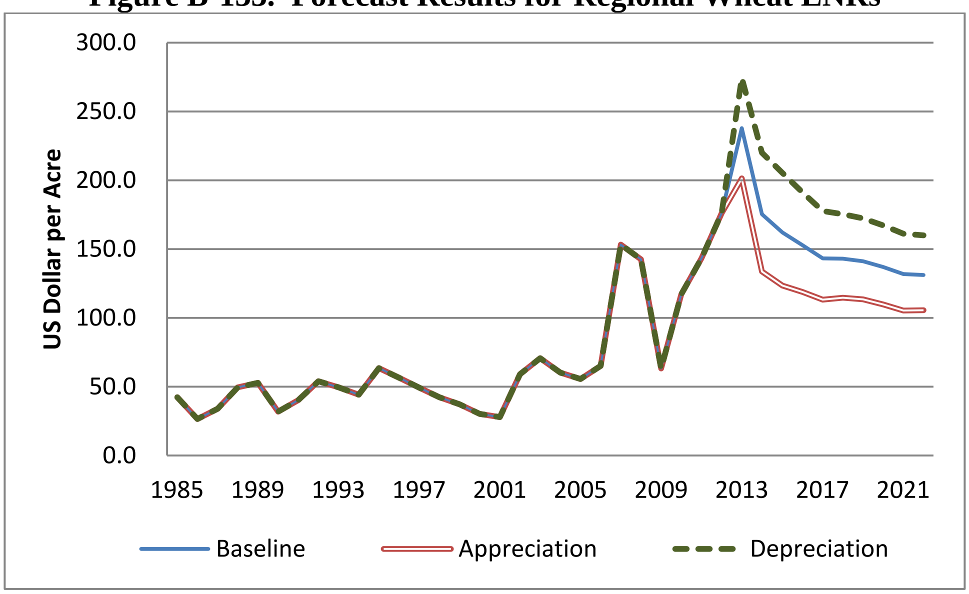


Figure B-134. Forecast Results for the U.S. Peanut Price

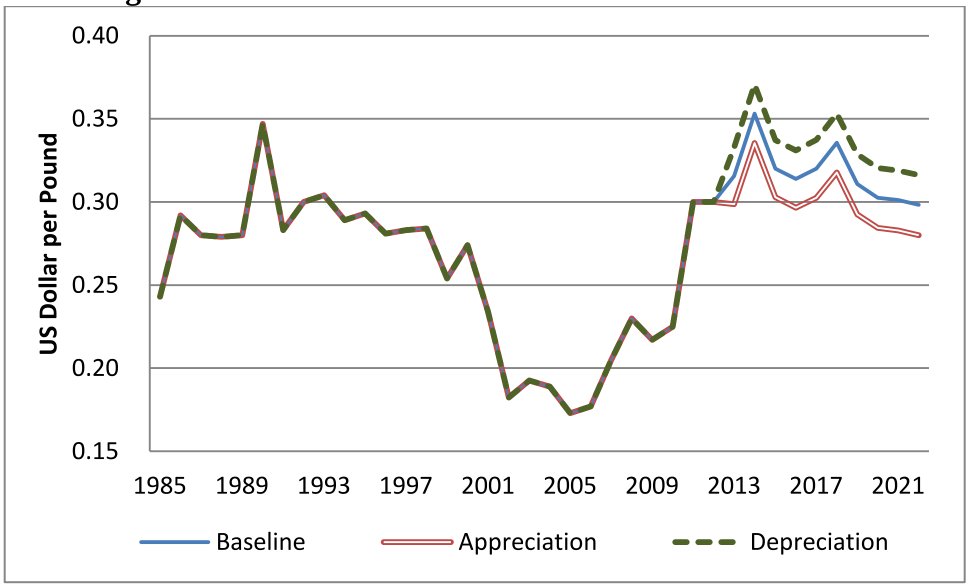


Figure B-135. Forecast Results for the U.S. Peanut Total Planted Acres

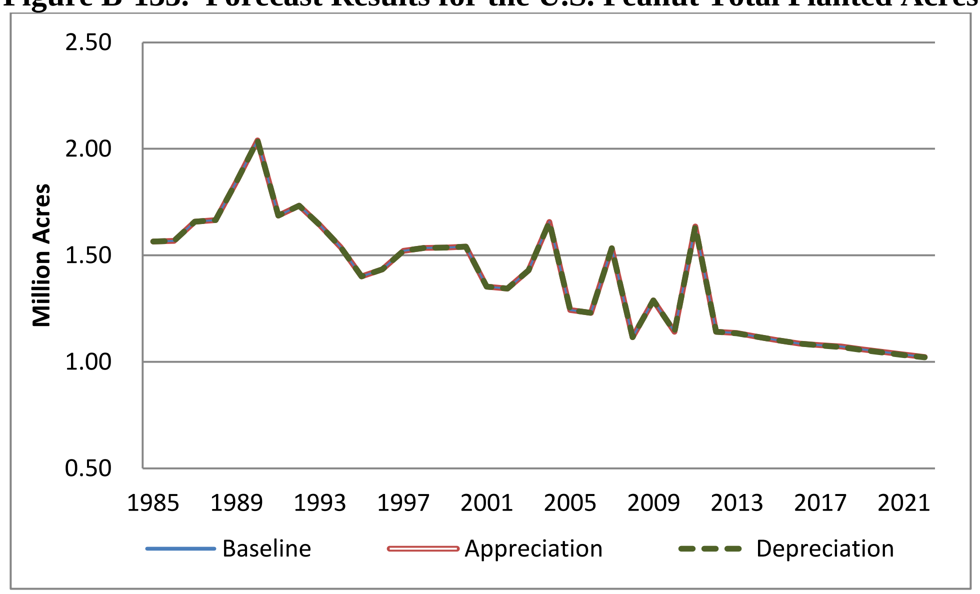


Figure B-136. Forecast Results for the U.S. Peanut Total Production

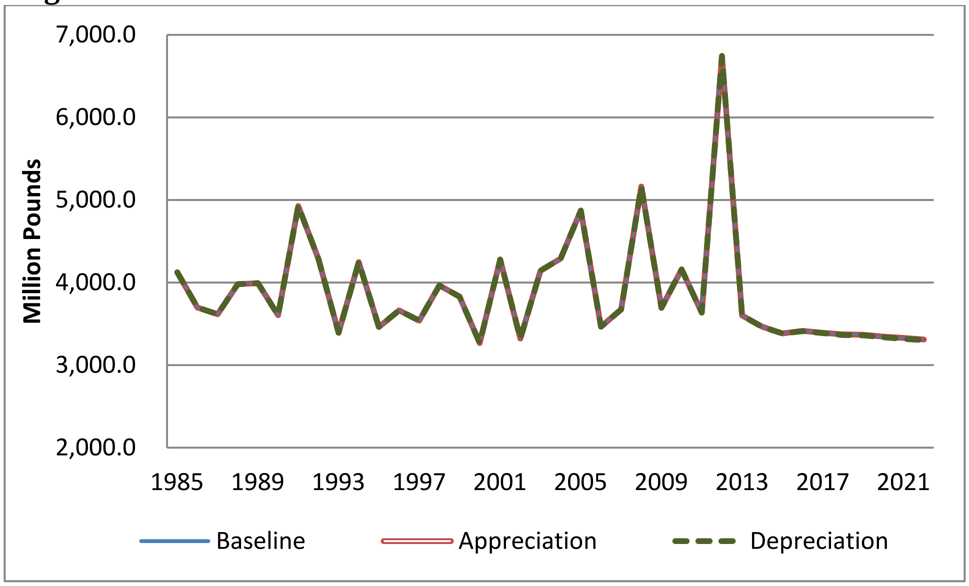
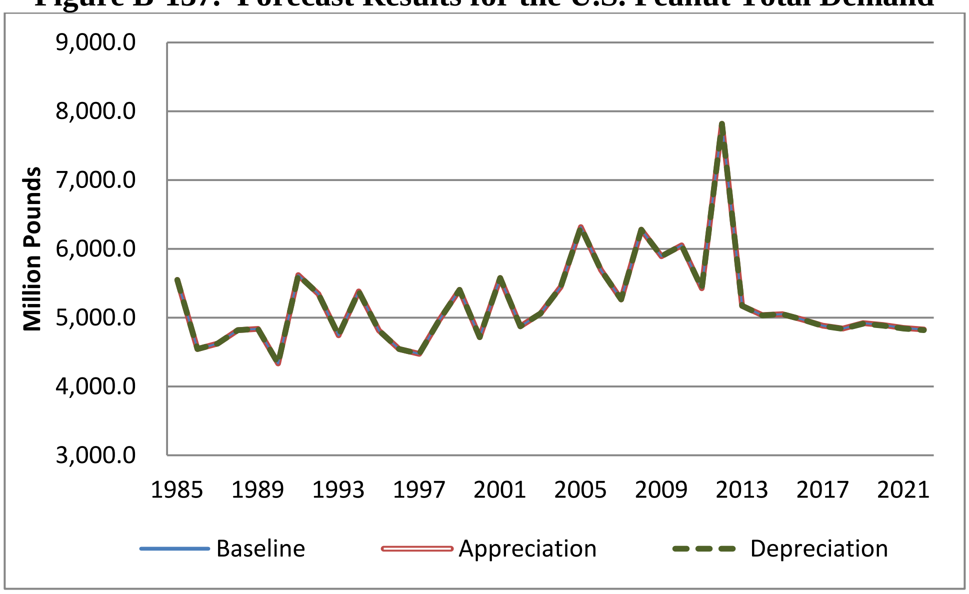


Figure B-137. Forecast Results for the U.S. Peanut Total Demand



Note: Total demand includes seed, loss, shrinkage, and residual, crushing, export demand, and ending stocks.

Figure B-138. Forecast Results for Regional Peanut ENRs

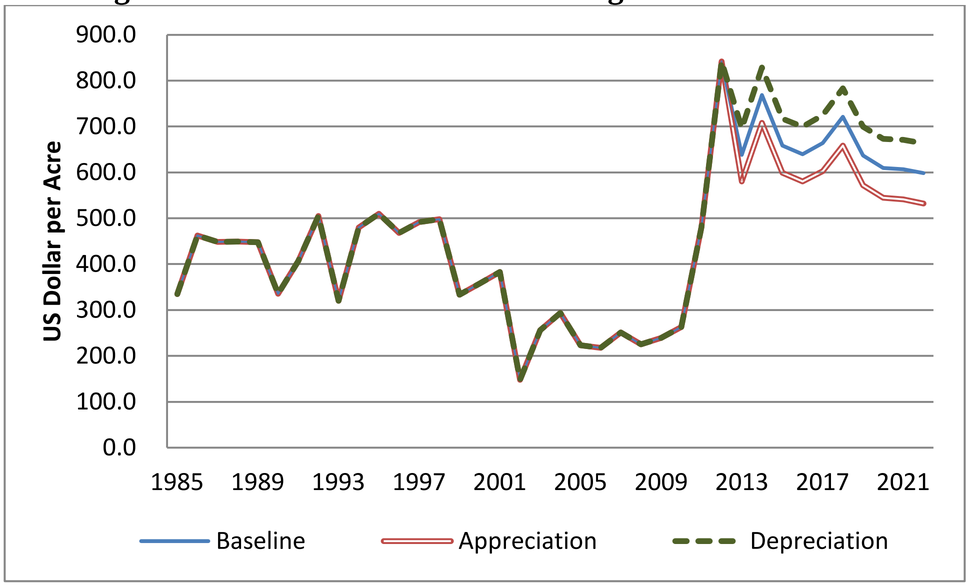


Figure B-139. Forecast Results for the U.S. Ethanol Price

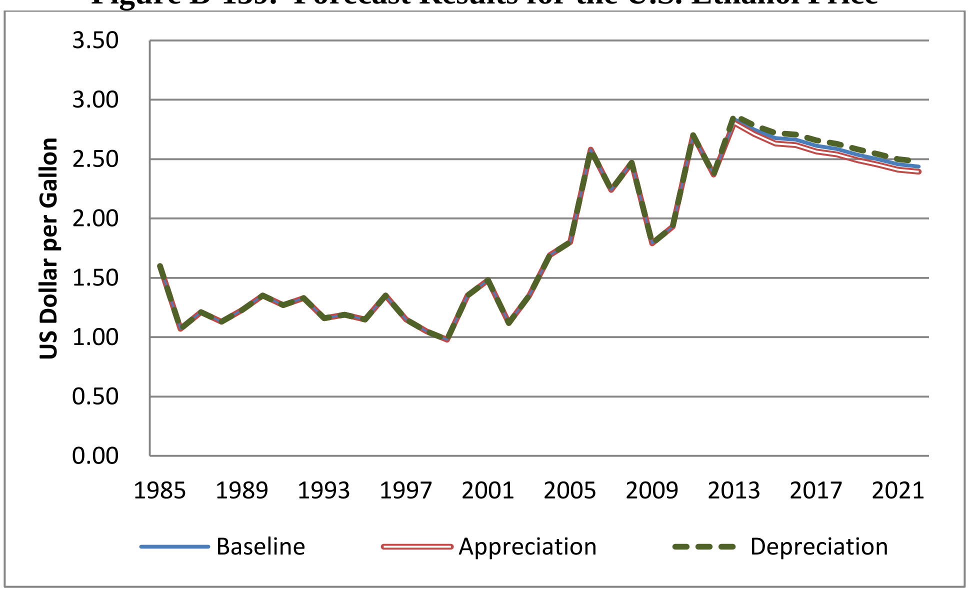


Figure B-140. Forecast Results for the U.S. Ethanol Total Production

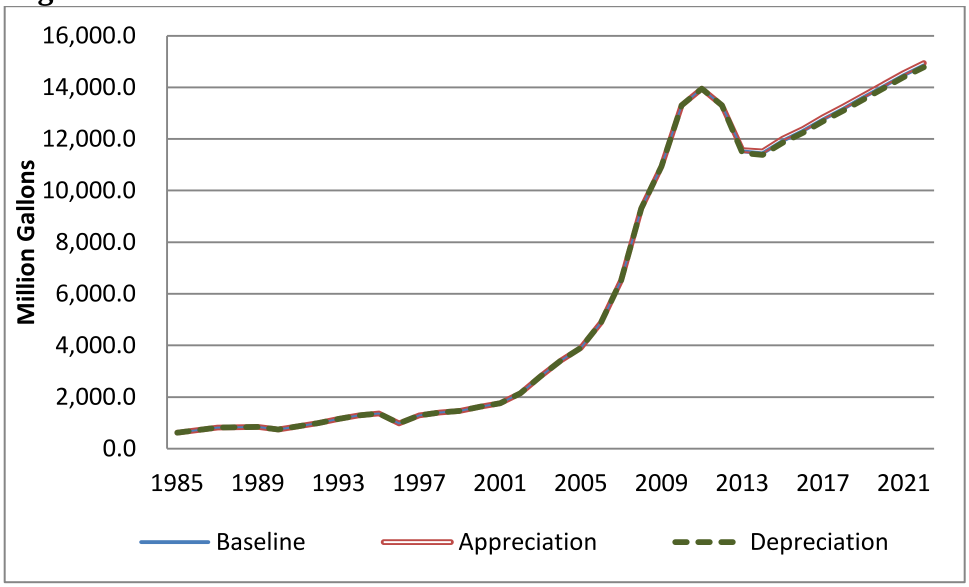
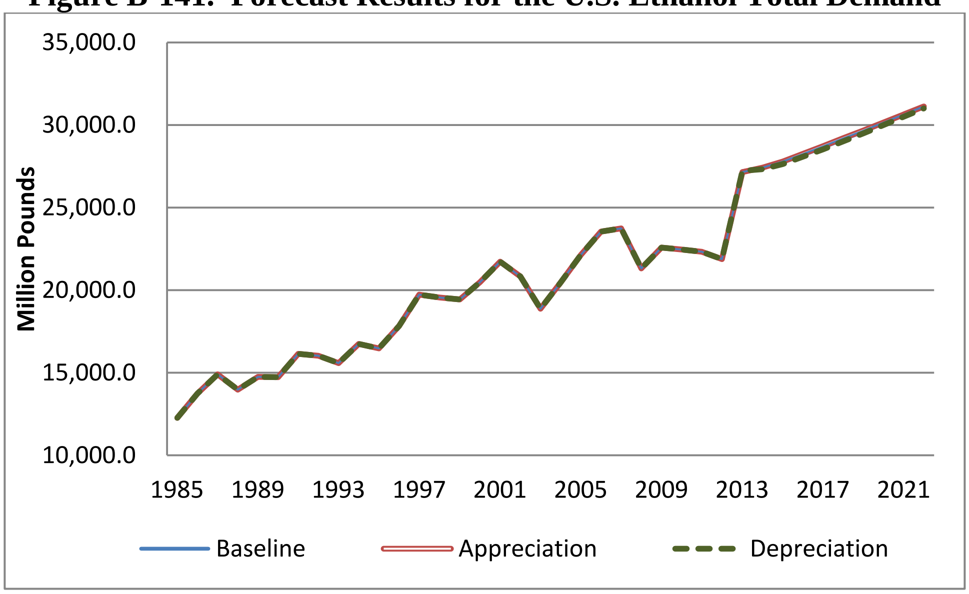


Figure B-141. Forecast Results for the U.S. Ethanol Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-142. Forecast Results for the U.S. Ethanol Real Dry Milling Operating Margins

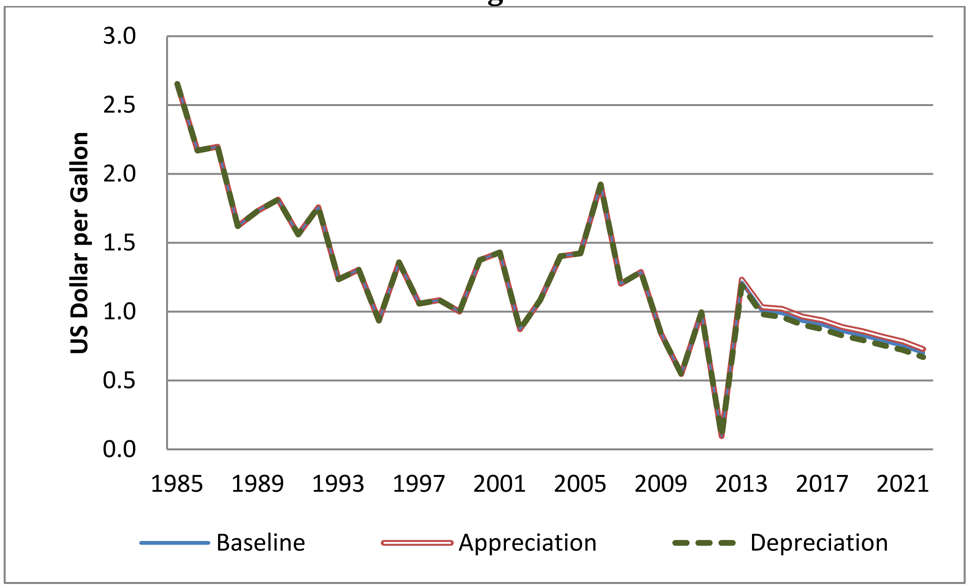


Figure B-143. Forecast Results for the U.S. Ethanol Real Wet Milling Operating Margins

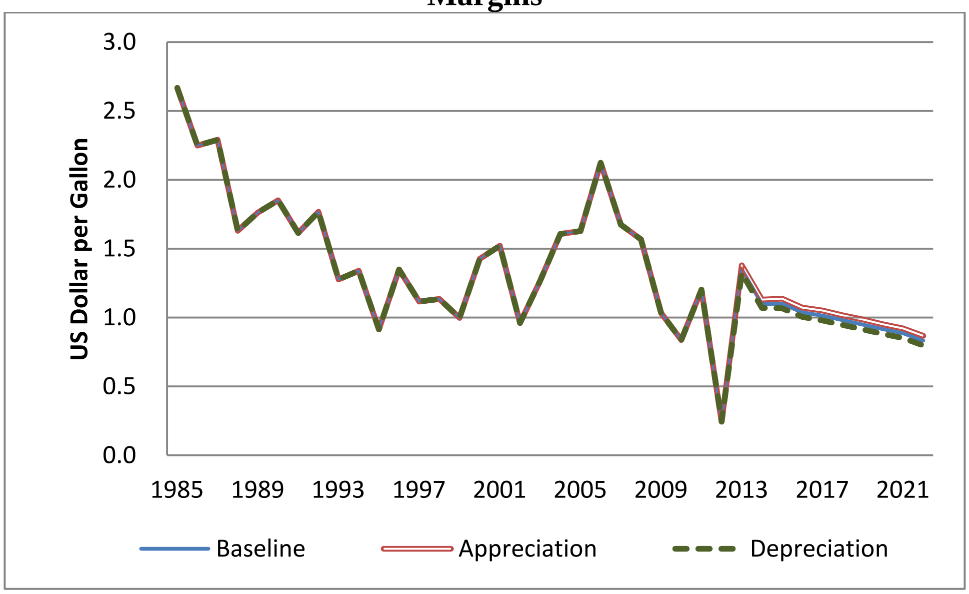


Figure B-144. Forecast Results for the U.S. Biodiesel Price

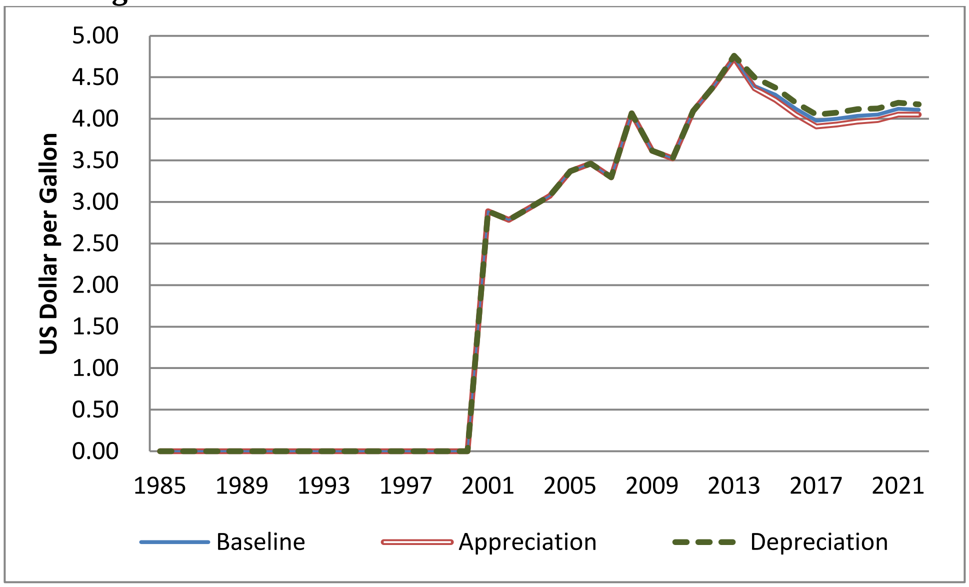


Figure B-145. Forecast Results for the U.S. Biodiesel Total Production

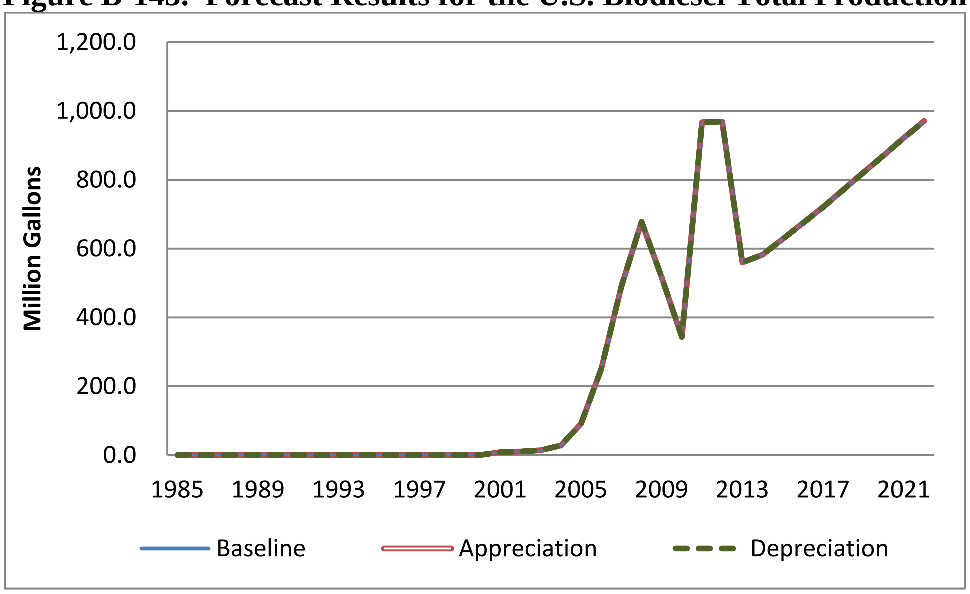
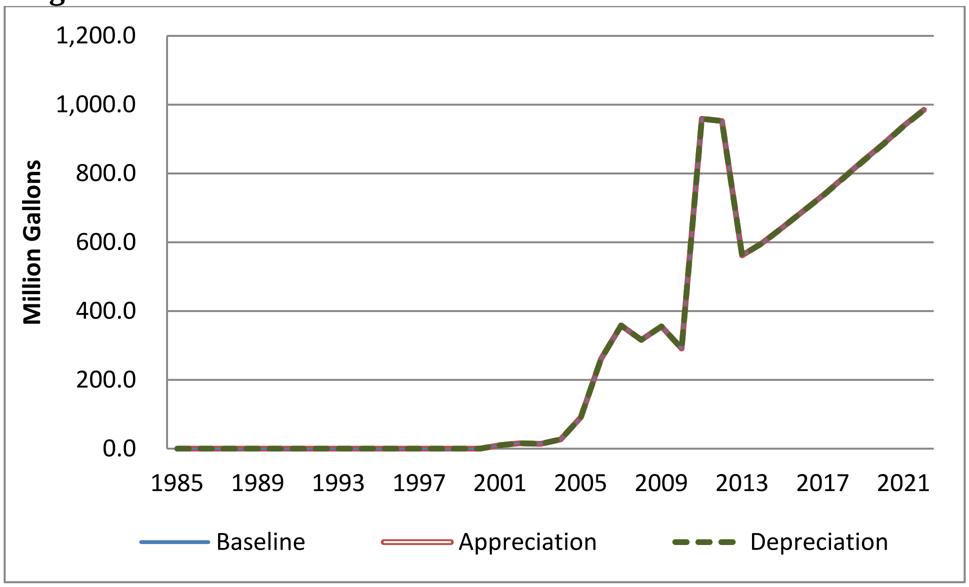


Figure B-146. Forecast Results for the U.S. Biodiesel Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-147. Forecast Results for the U.S. Biodiesel Real Operating margins

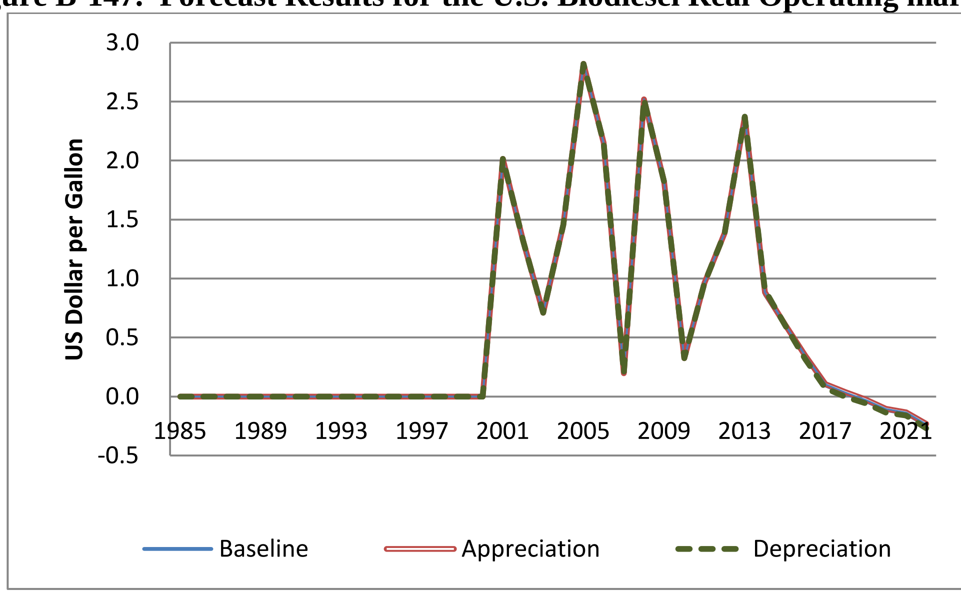
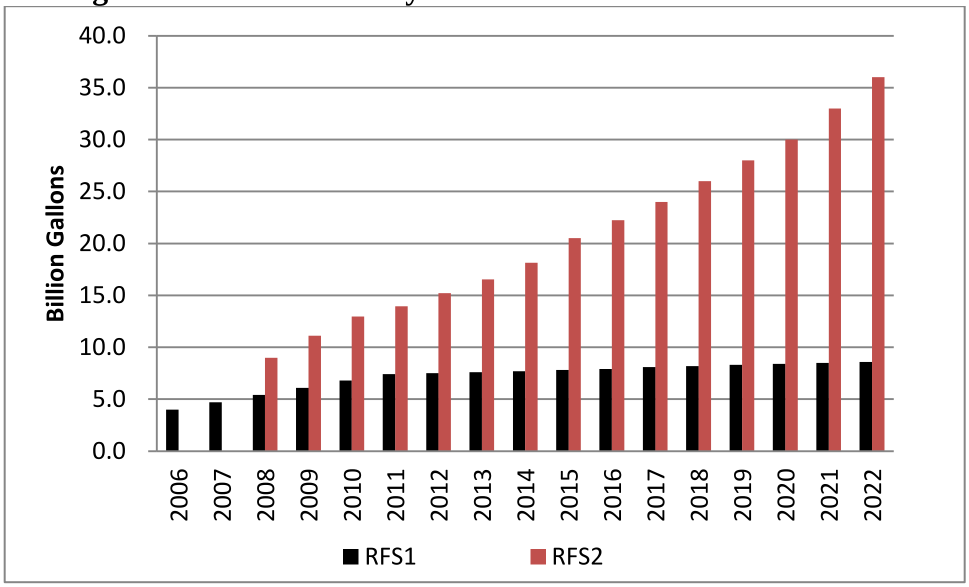


Figure B-148. Mandatory Volume under the RFS1 and RFS2



Note: The RFS1 mandatory volumes during 2013-2022 are estimates.
Source: Schnepf and Yacobucci (2013)

Figure B-149. Forecast Results for the U.S. Corn Price

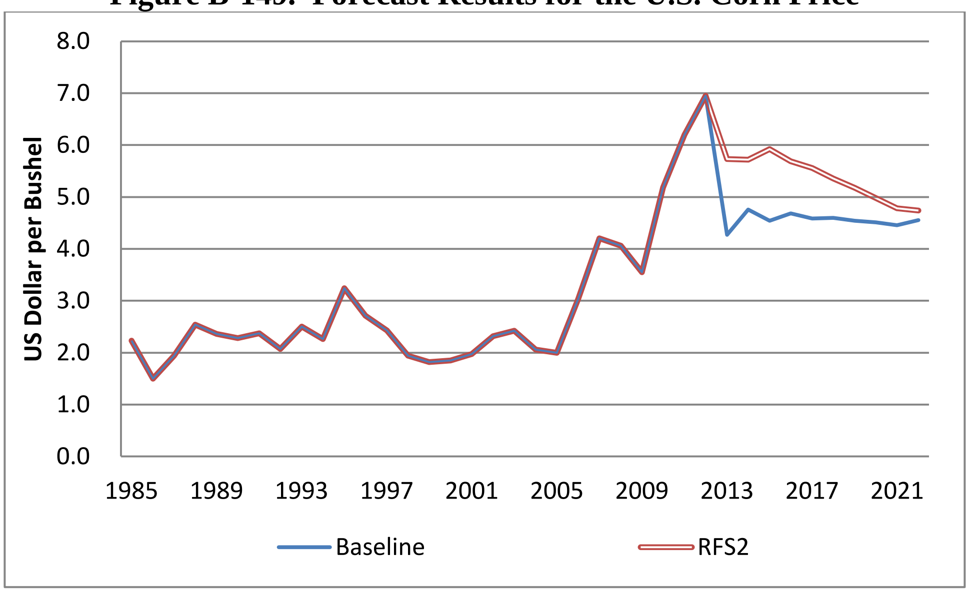


Figure B-150. Forecast Results for the U.S. Corn Total Planted Acres

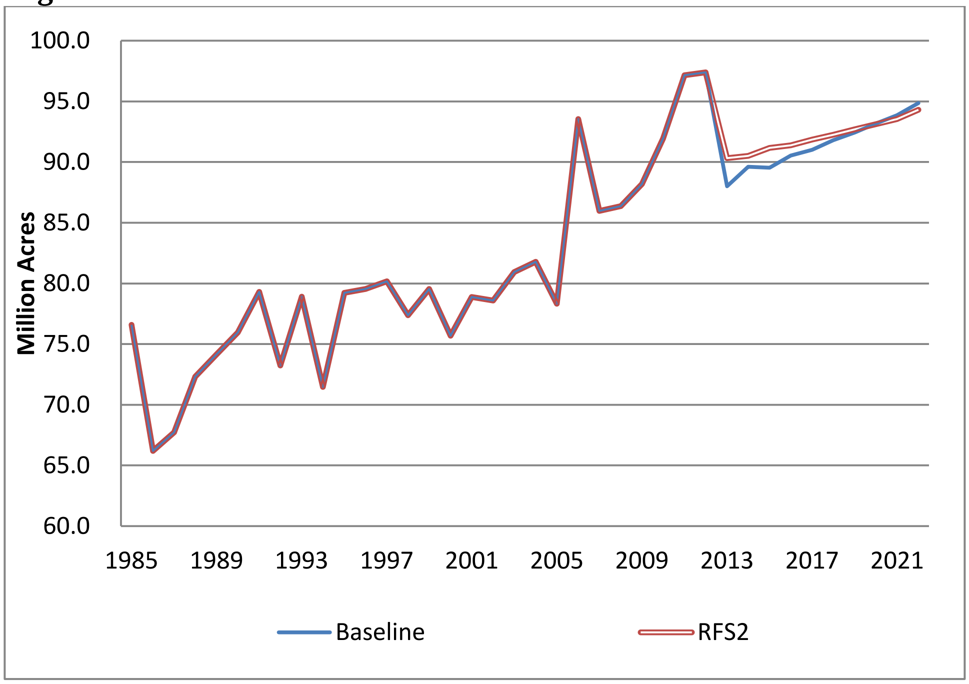


Figure B-151. Forecast Results for the U.S. Corn Total Production

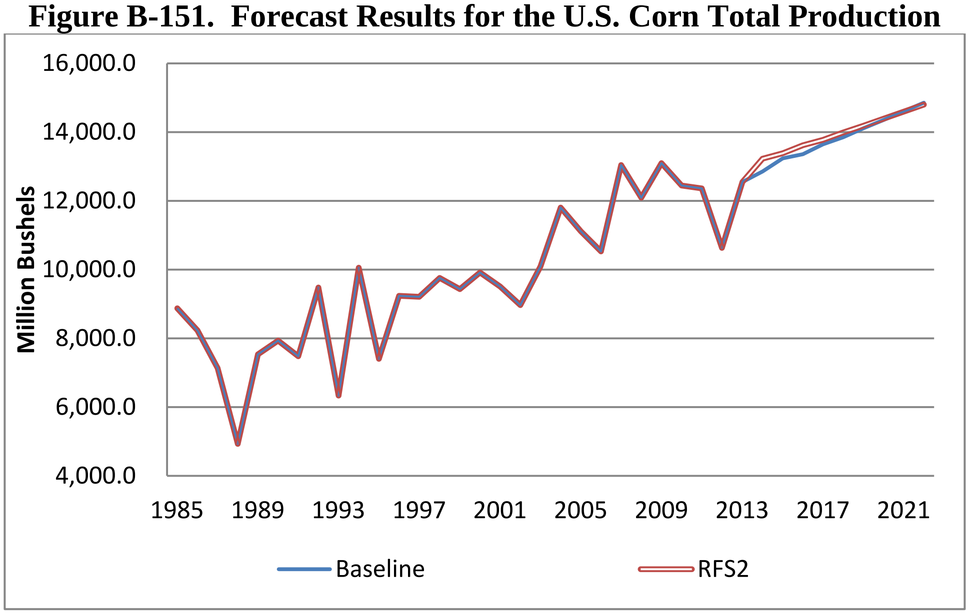
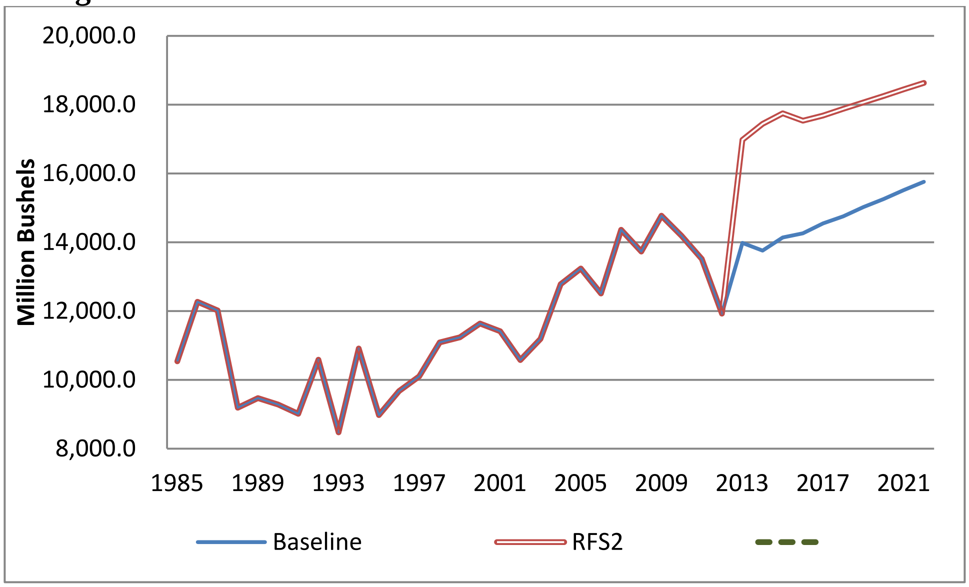


Figure B-152. Forecast Results for the U.S. Corn Total Demand



Note: Total demand includes seed, feed and residual, food and industrial, alcohol (energy), export demand, and ending stocks.

Figure B-153. Forecast Results for Regional Corn ENRs

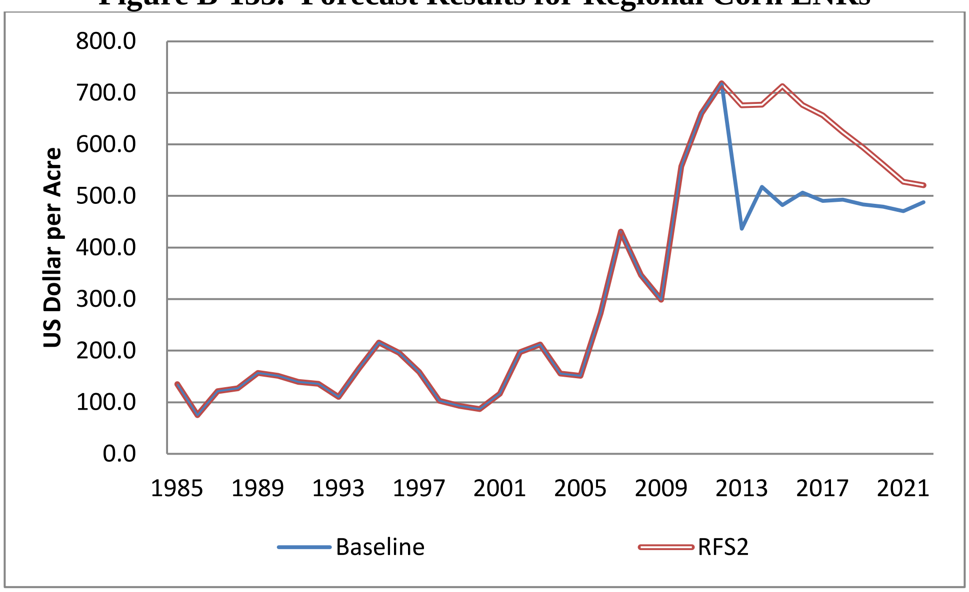


Figure B-154. Forecast Results for the U.S. Barley Price

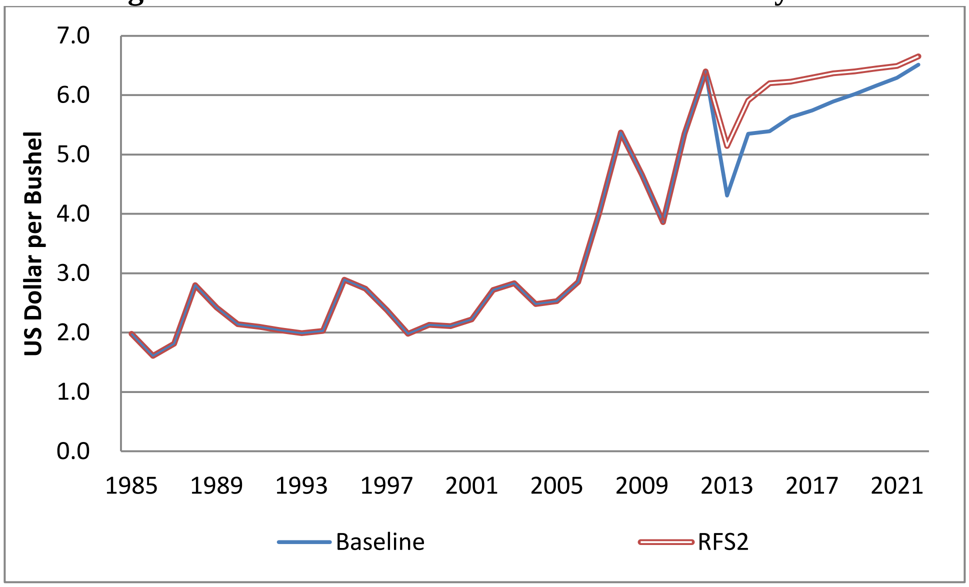


Figure B-155. Forecast Results for the U.S. Barley Total Planted Acres

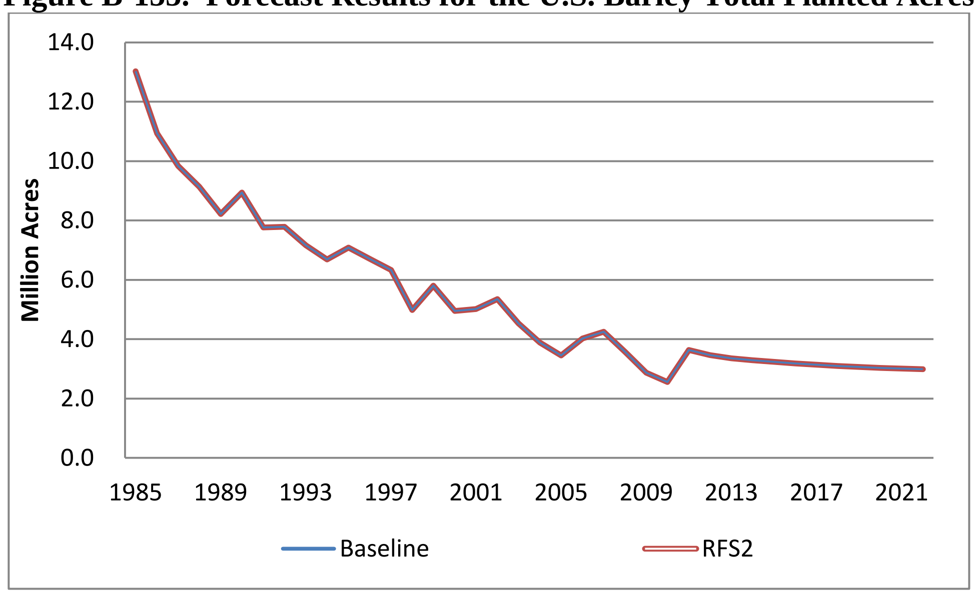


Figure B-156. Forecast Results for the U.S. Barley Total Production

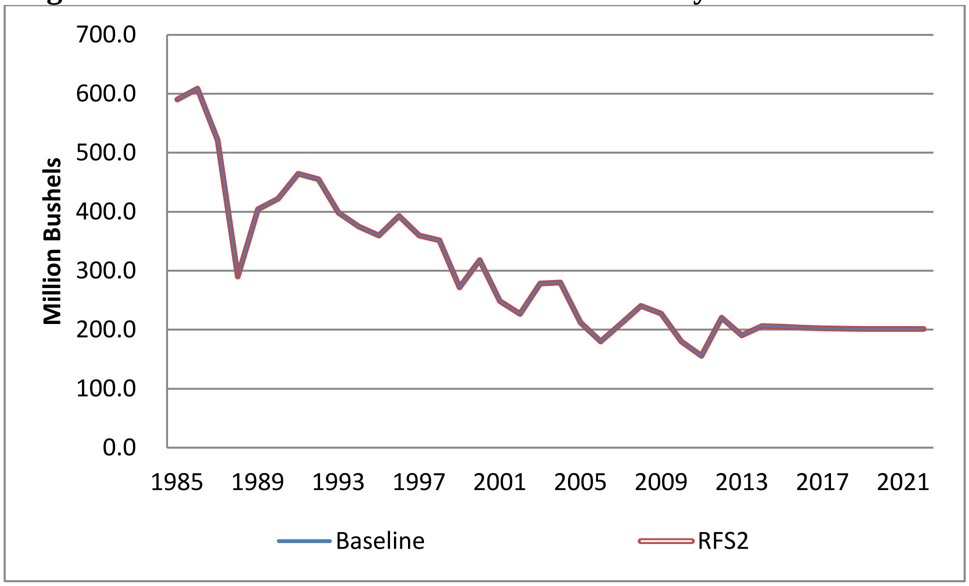
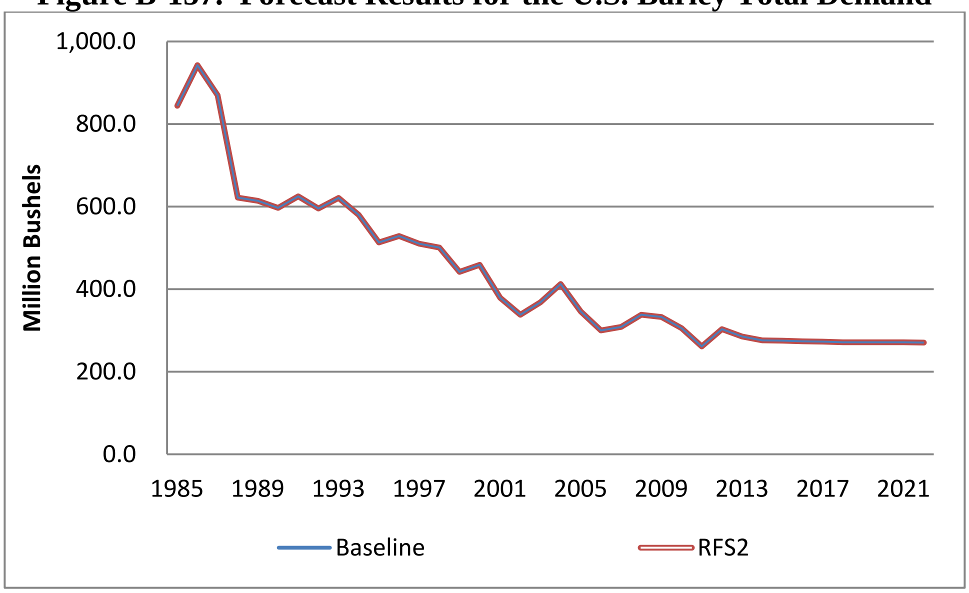


Figure B-157. Forecast Results for the U.S. Barley Total Demand



Note: Total demand includes seed, feed, food, export demand, and ending stocks.

Figure B-158. Forecast Results for Regional Barley ENRs

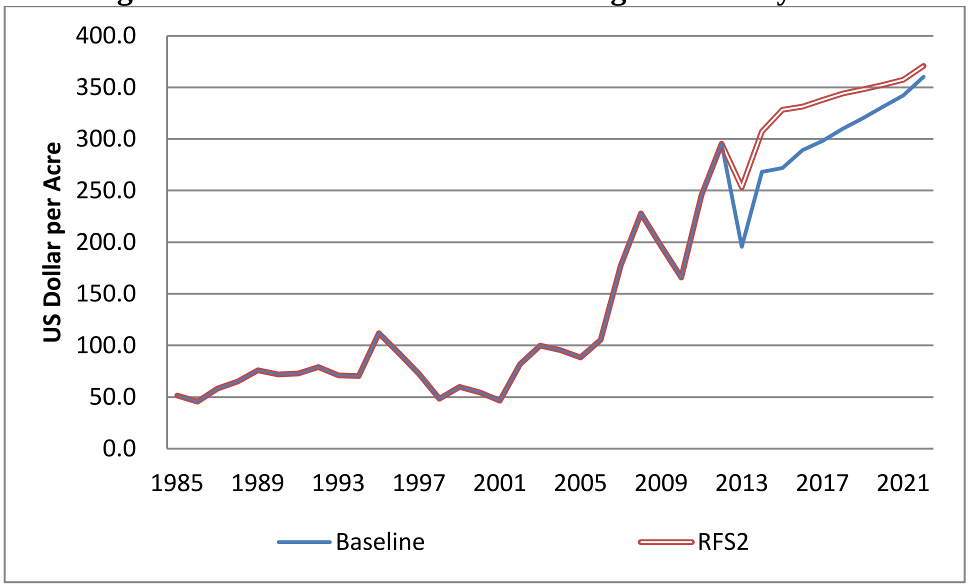


Figure B-159. Forecast Results for the U.S. Cotton Price

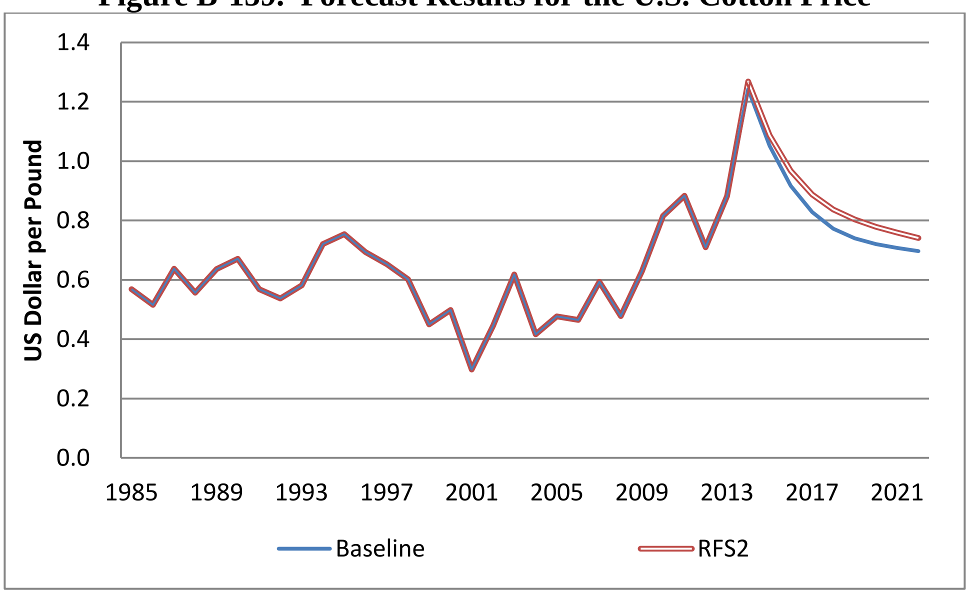


Figure B-160. Forecast Results for the U.S. Cotton Total Planted Acres

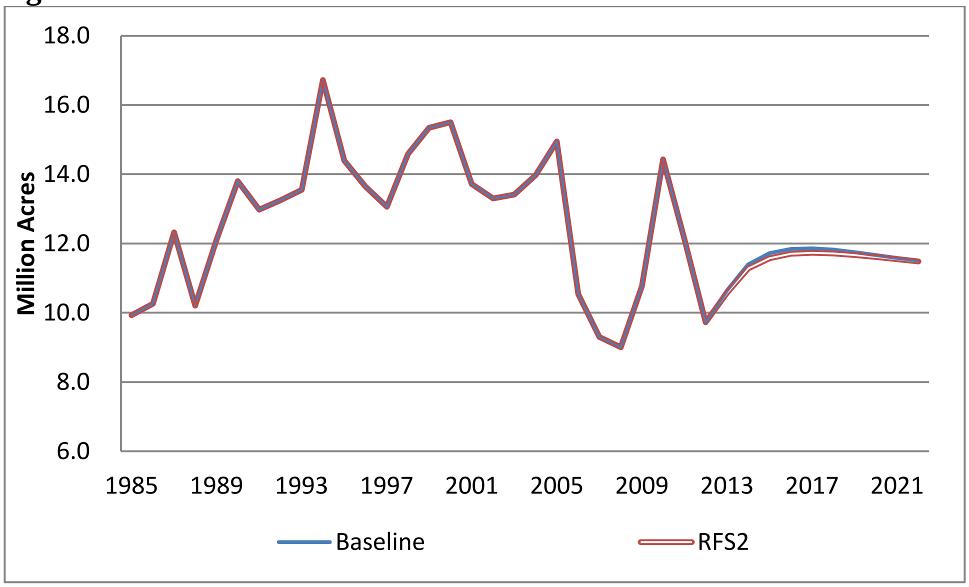


Figure B-161. Forecast Results for the U.S. Cotton Total Production

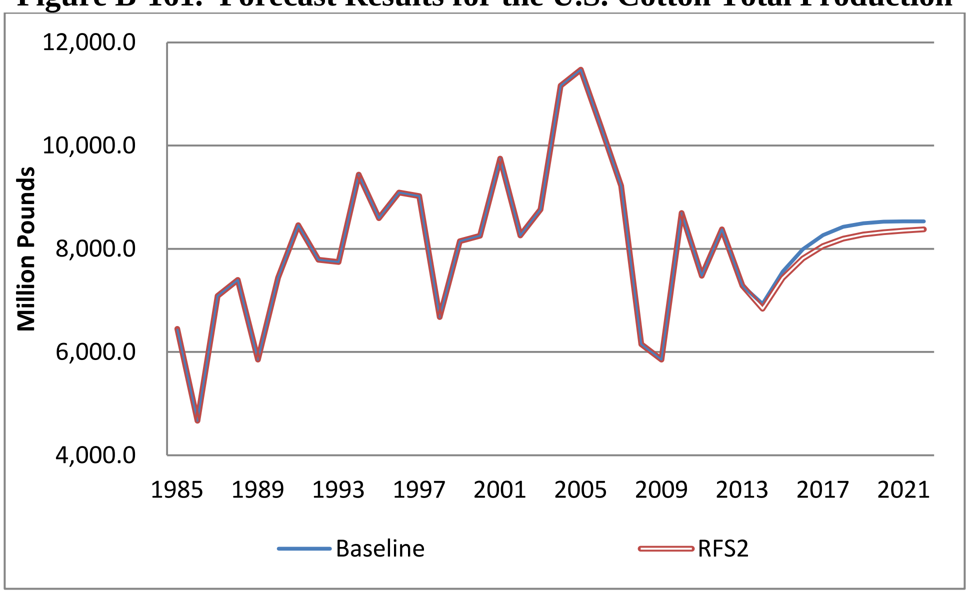
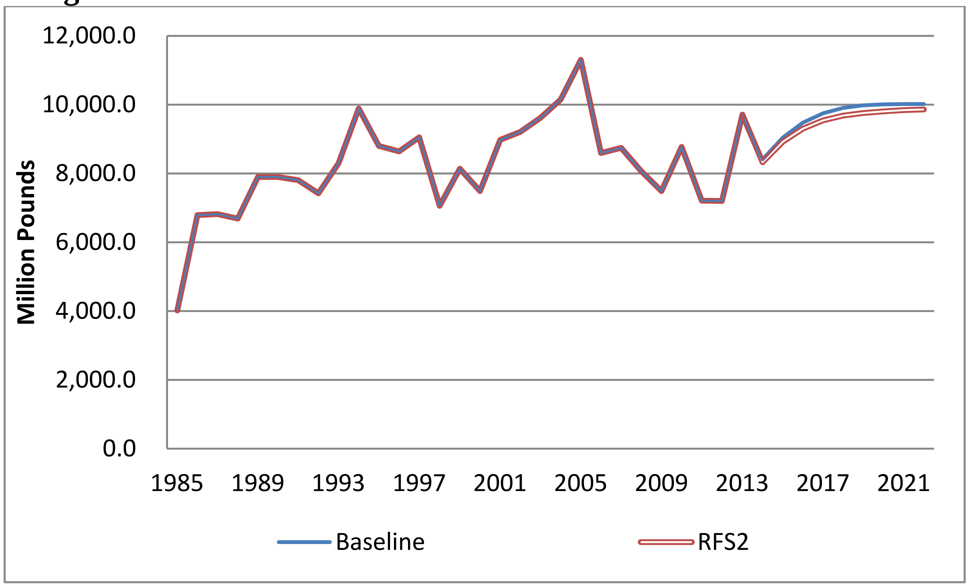


Figure B-162. Forecast Results for the U.S. Cotton Total Demand



Note: Total demand includes milling, export demand, and ending stocks.

Figure B-163. Forecast Results for Regional Cotton ENRs

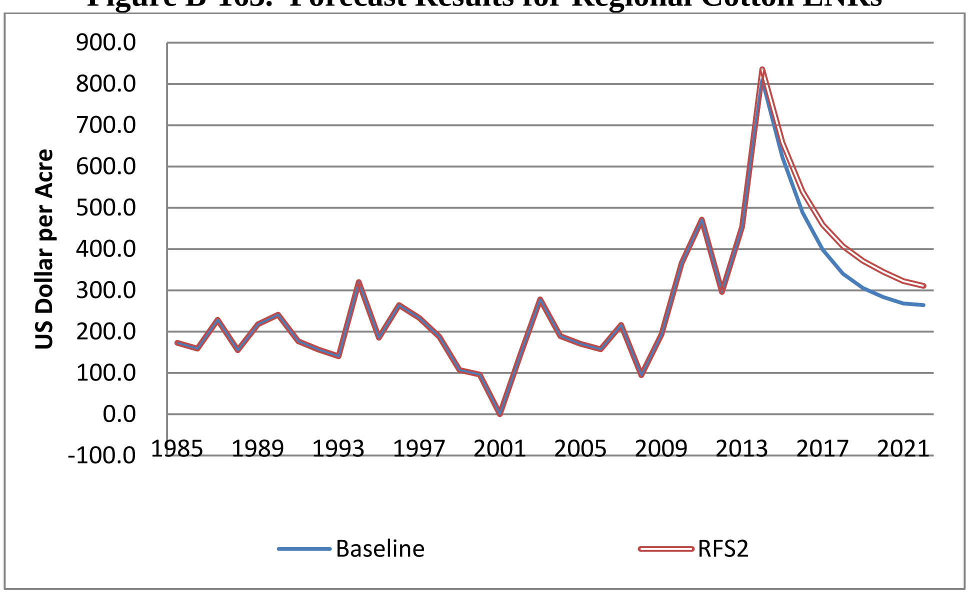


Figure B-164. Forecast Results for the U.S. Oat Price

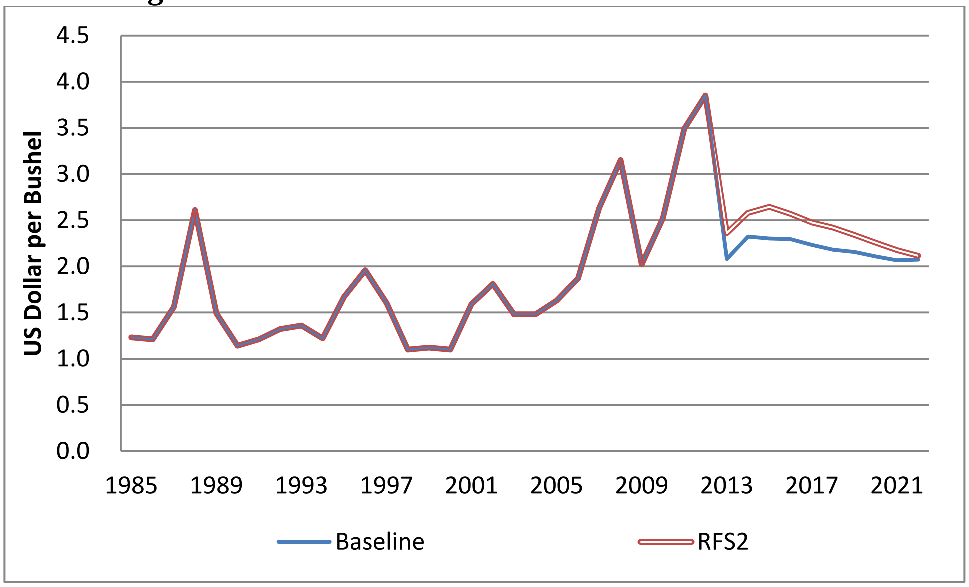


Figure B-165. Forecast Results for the U.S. Oat Total Planted Acres

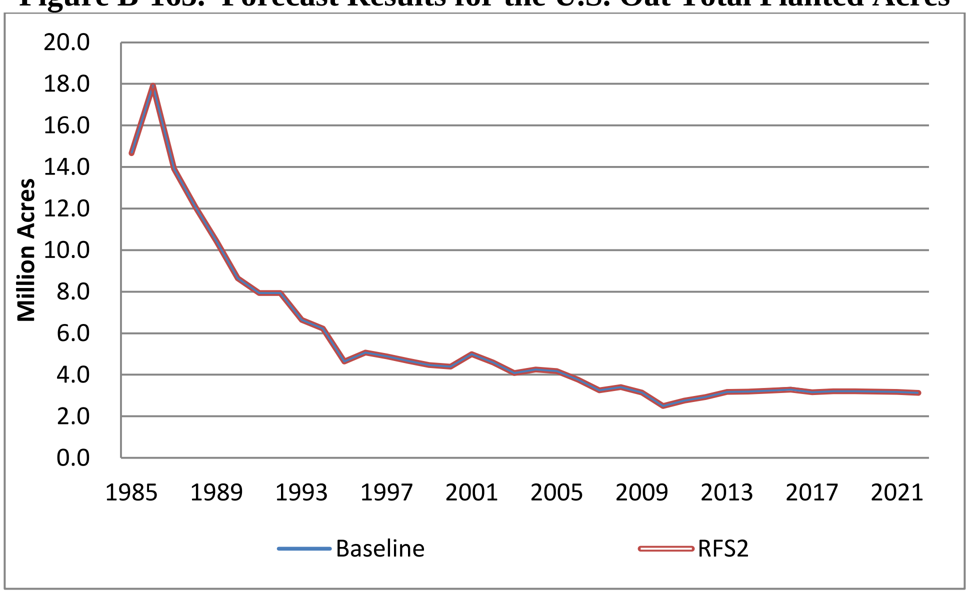


Figure B-166. Forecast Results for the U.S. Oat Total Production

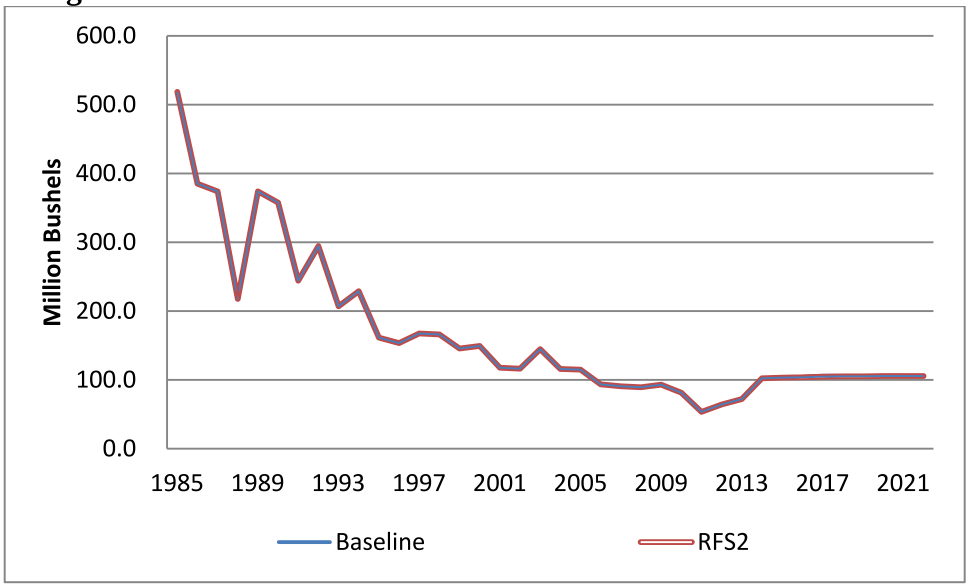
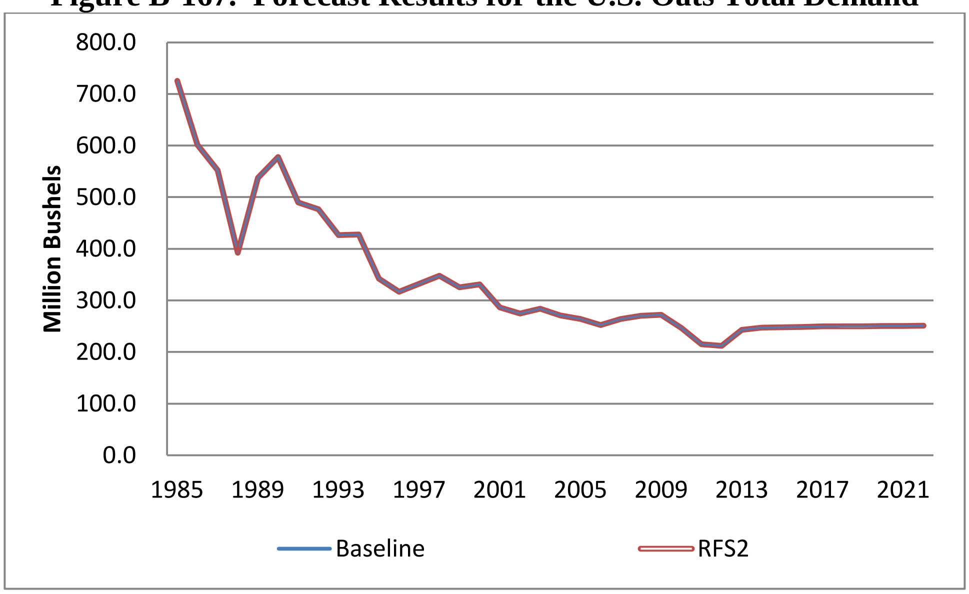


Figure B-167. Forecast Results for the U.S. Oats Total Demand



Note: Total demand includes seed, feed, food, export demand, and ending stocks.

Figure B-168. Forecast Results for Regional Oat ENRs

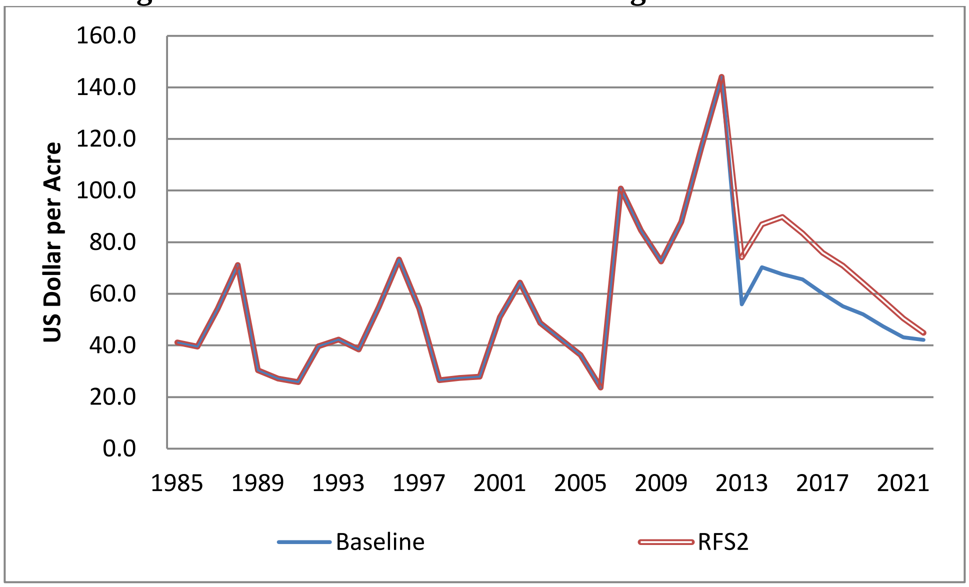


Figure B-169. Forecast Results for the U.S. LG Rice Price

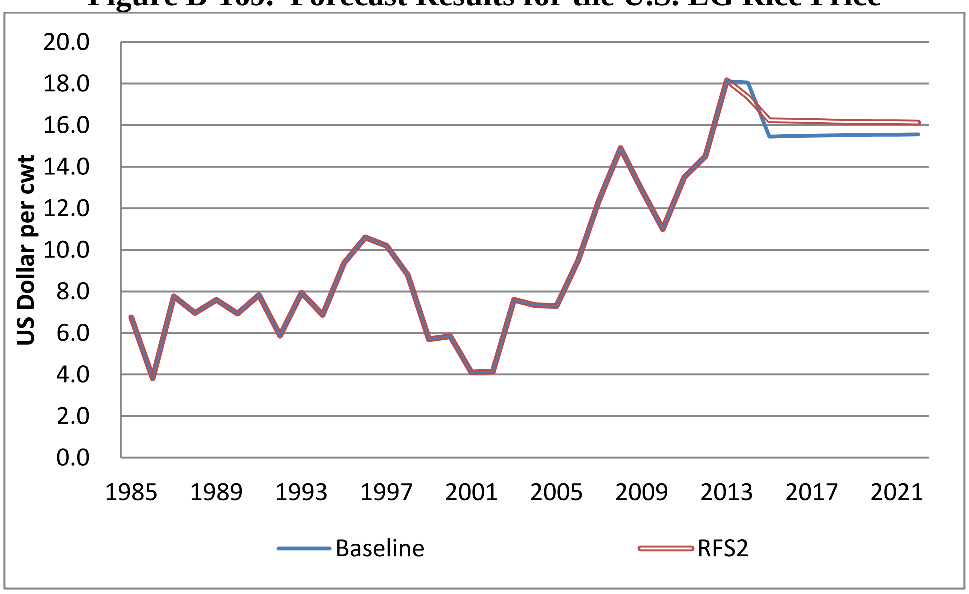


Figure B-170. Forecast Results for the U.S. LG Rice Total Planted Acres

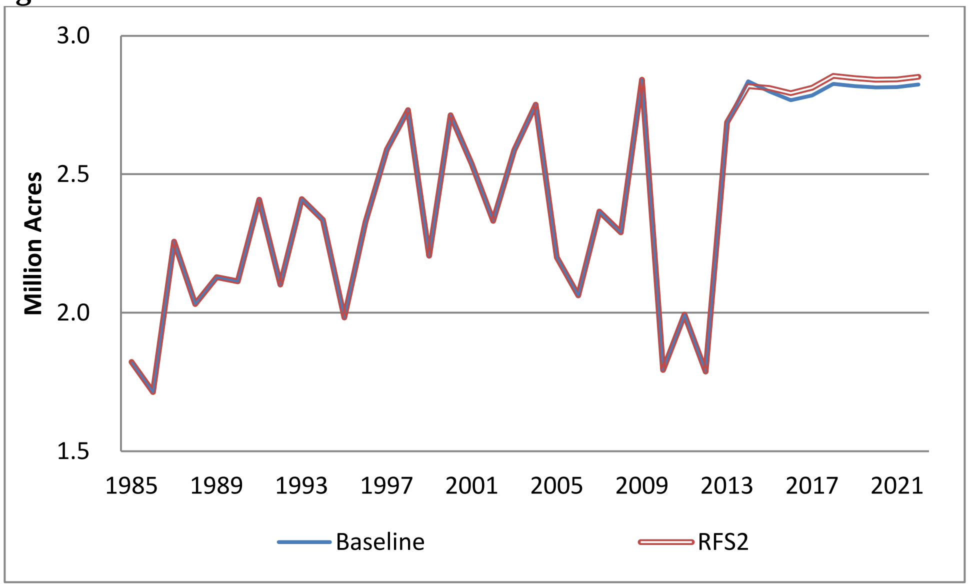


Figure B-171. Forecast Results for the U.S. LG Rice Total Production

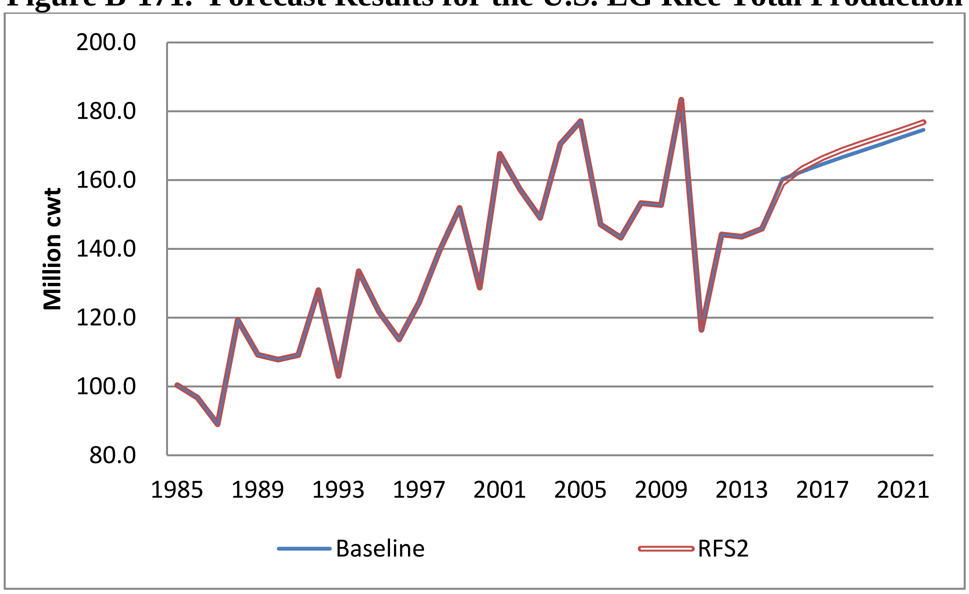
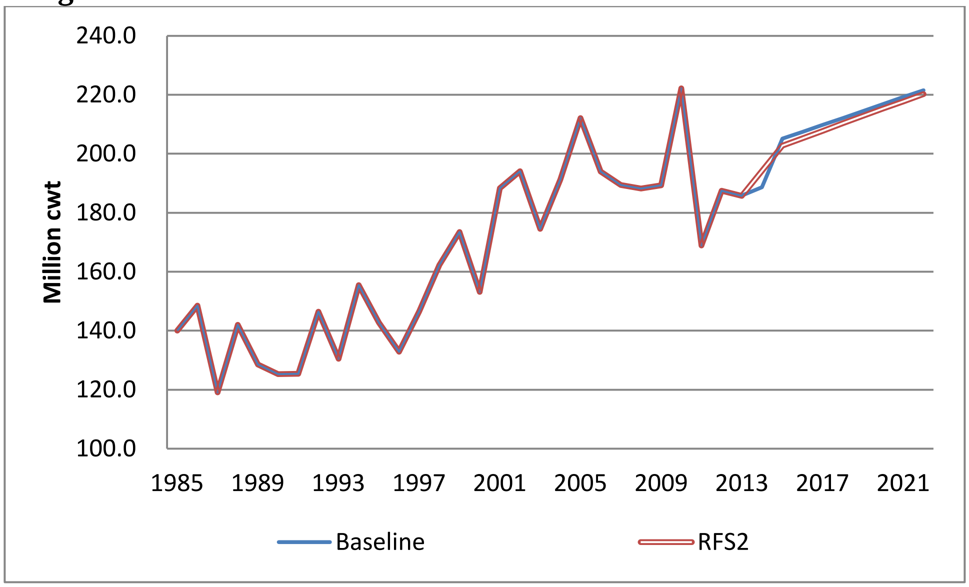


Figure B-172. Forecast Results for the U.S. LG rice Total Demand



Note: Total demand includes domestic and residual, export demand, and ending stocks.

Figure B-173. Forecast Results for Regional LG Rice ENRs

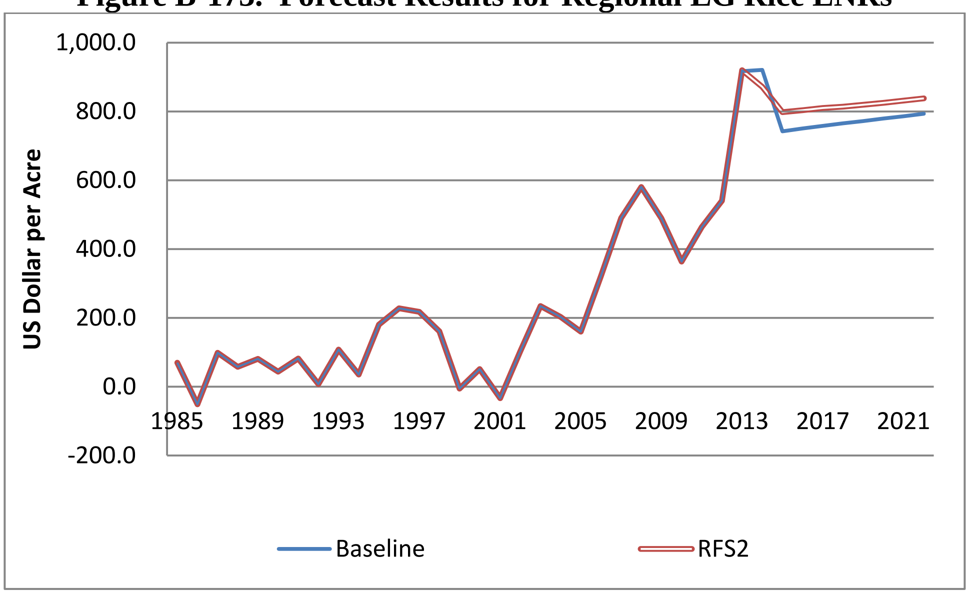


Figure B-174. Forecast Results for the U.S. MSG Rice Price

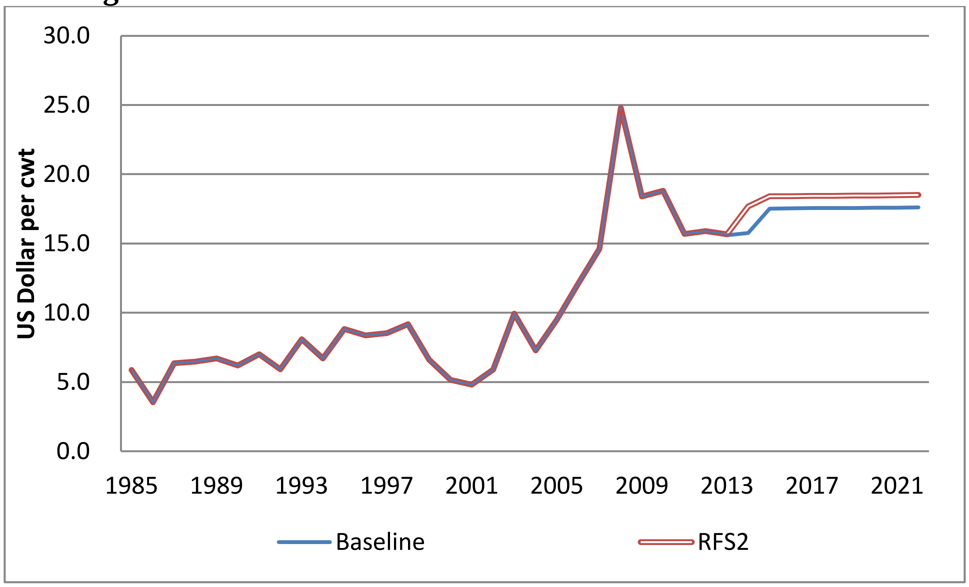


Figure B-175. Forecast Results for the U.S. MSG Rice Total Planted Acres

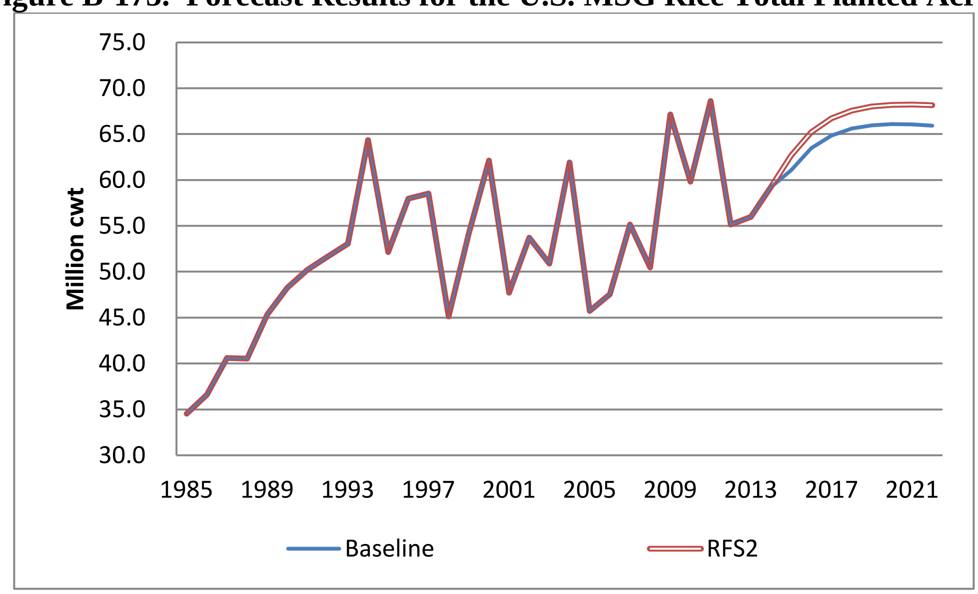


Figure B-176. Forecast Results for the U.S. MSG Rice Total Production

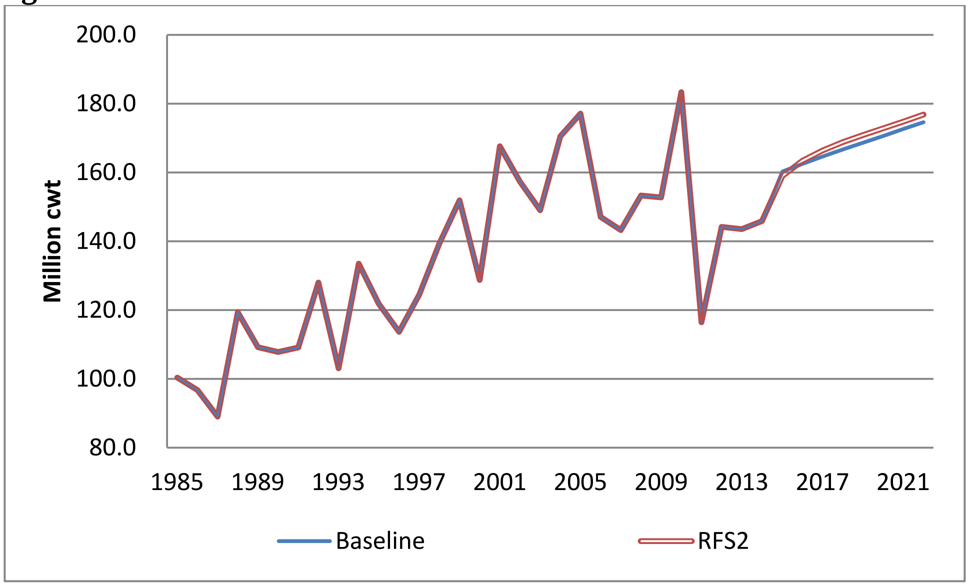
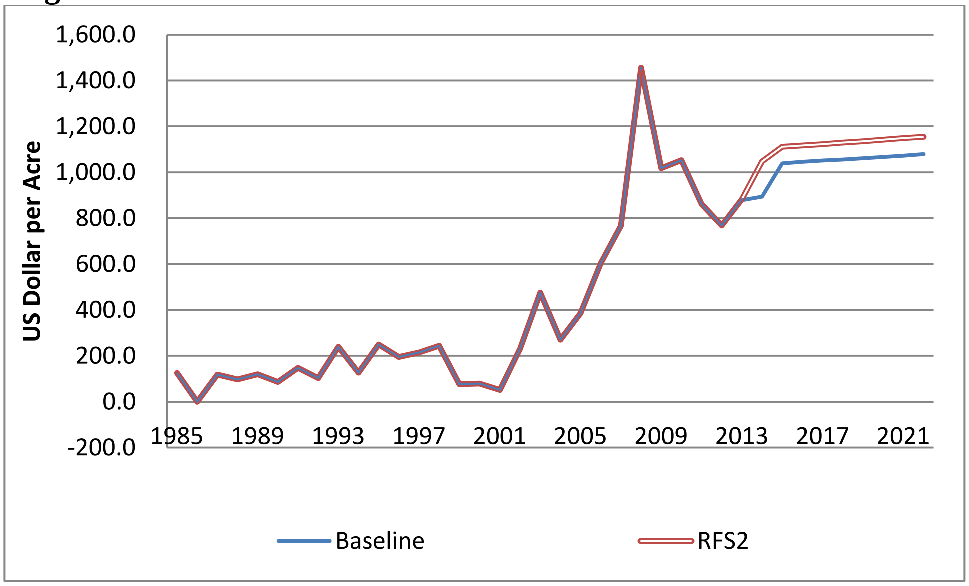


Figure B-177. Forecast Results for the U.S. MSG rice Total Demand



Note: Total demand includes domestic and residual, export demand, and ending stocks.

Figure B-178. Forecast Results for Regional MSG Rice ENRs

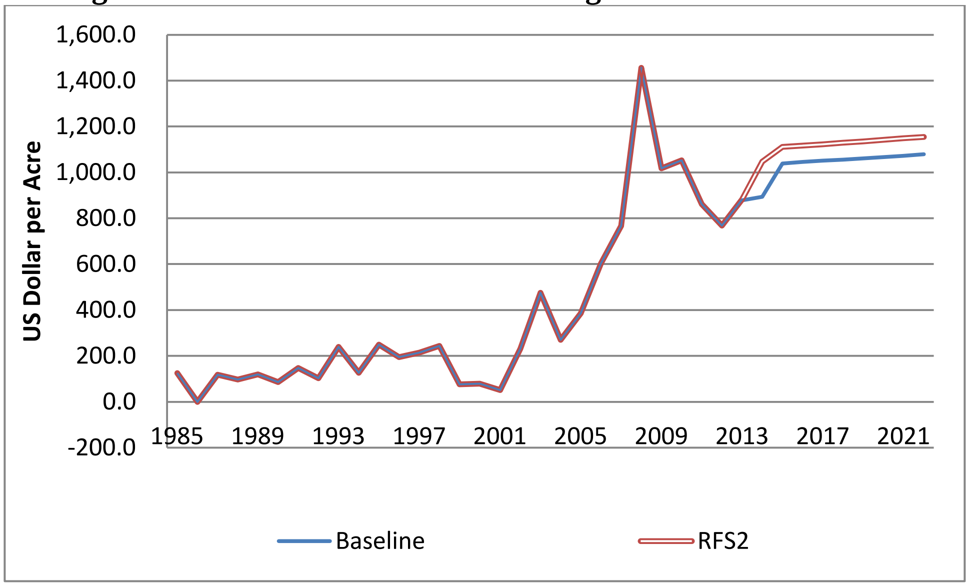


Figure B-179. Forecast Results for the U.S. Sorghum Price

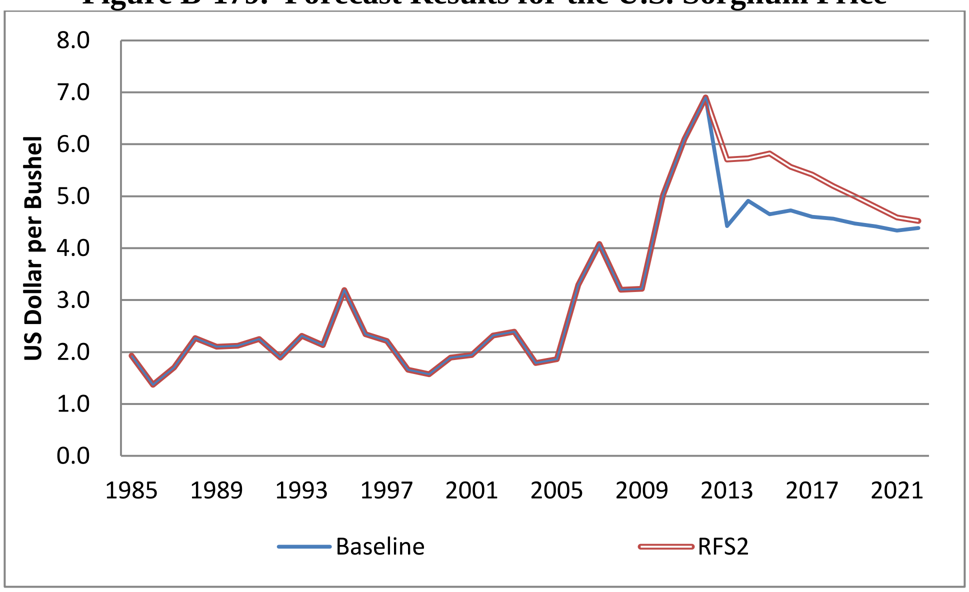


Figure B-180. Forecast Results for the U.S. Sorghum Total Planted Acres

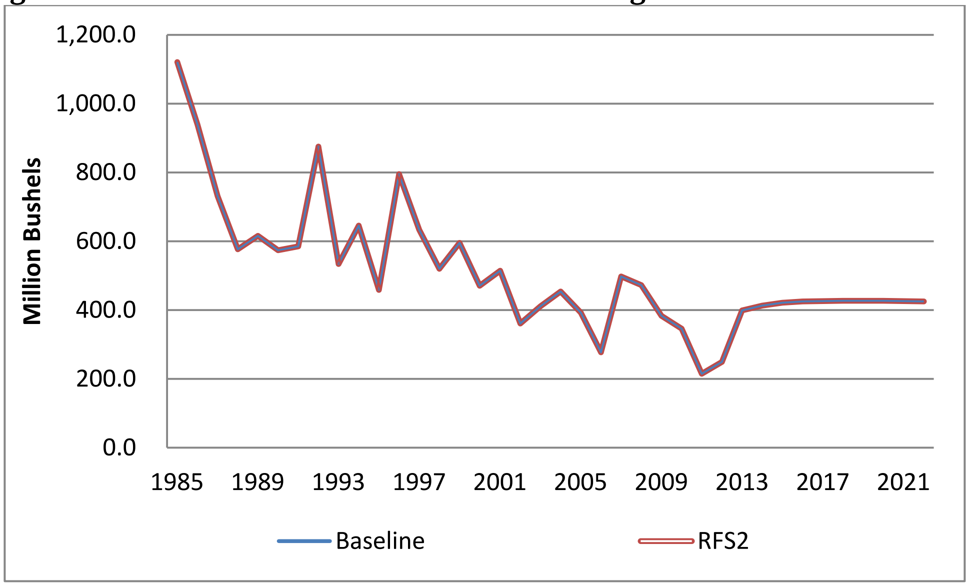


Figure B-181. Forecast Results for the U.S. Sorghum Total Production

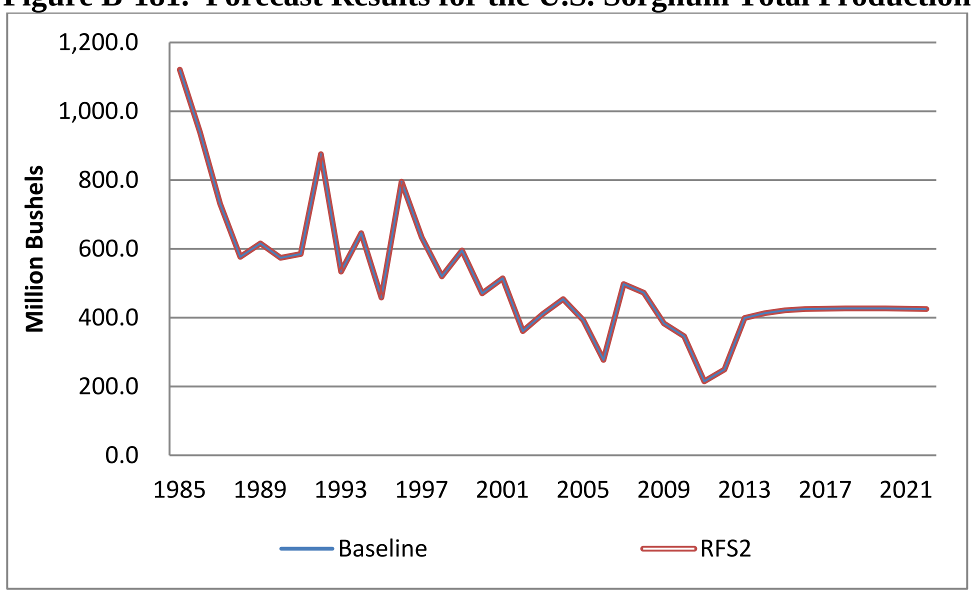
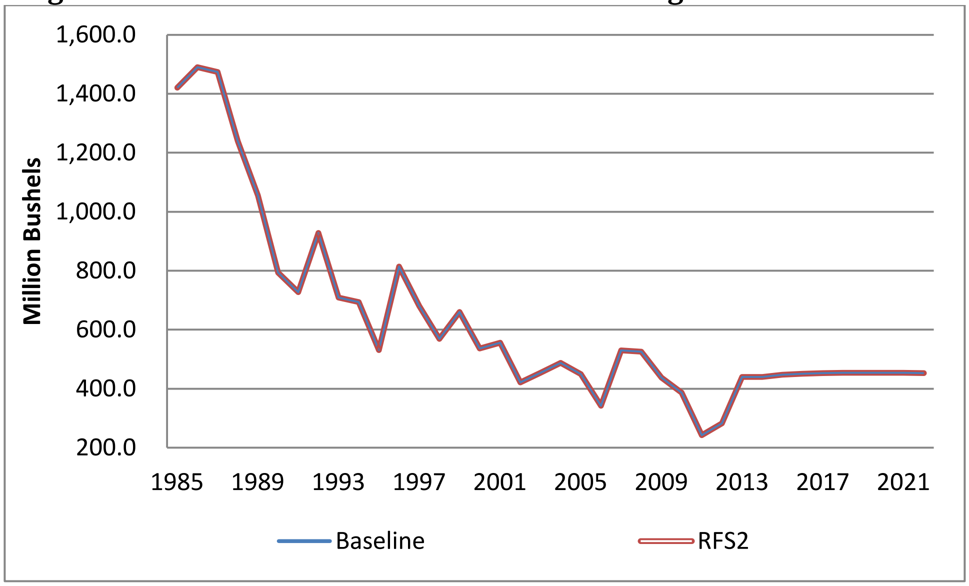


Figure B-182. Forecast Results for the U.S. Sorghum Total Demand



Note: Total demand includes seed, feed, food, export demand, and ending stocks.

Figure B-183. Forecast Results for Regional Sorghum ENRs

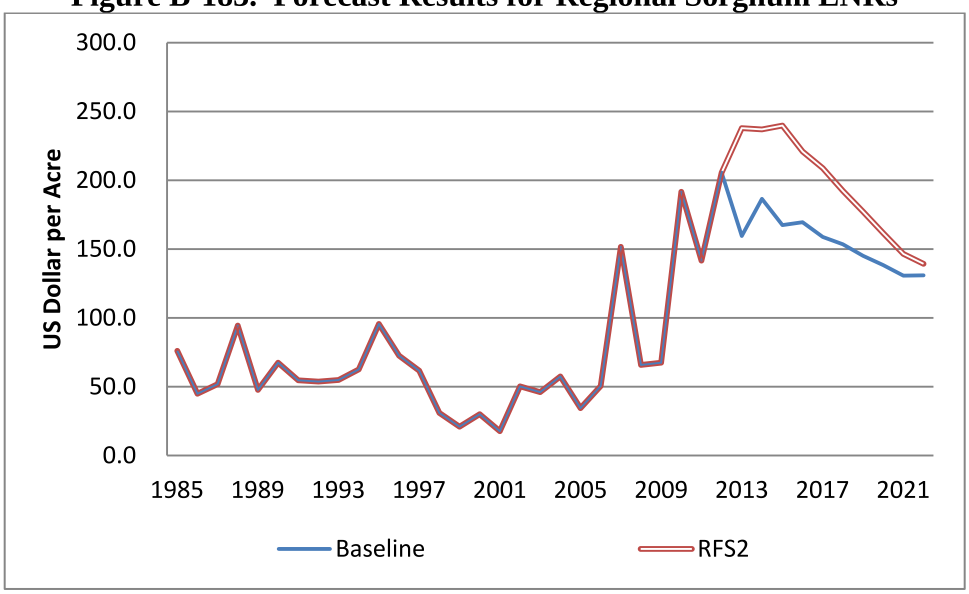


Figure B-184. Forecast Results for the U.S. Soybean Price

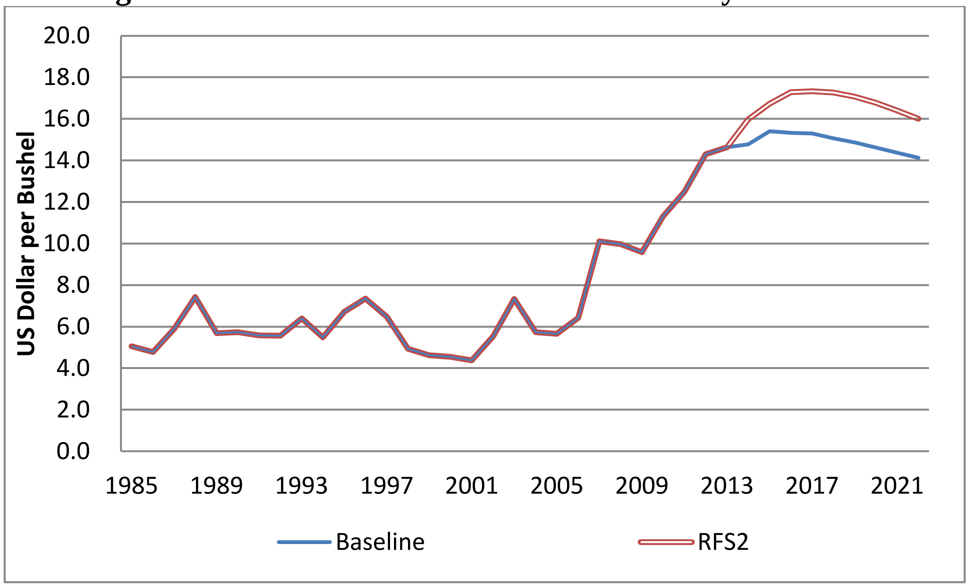


Figure B-185. Forecast Results for the U.S. Soybean Total Planted Acres

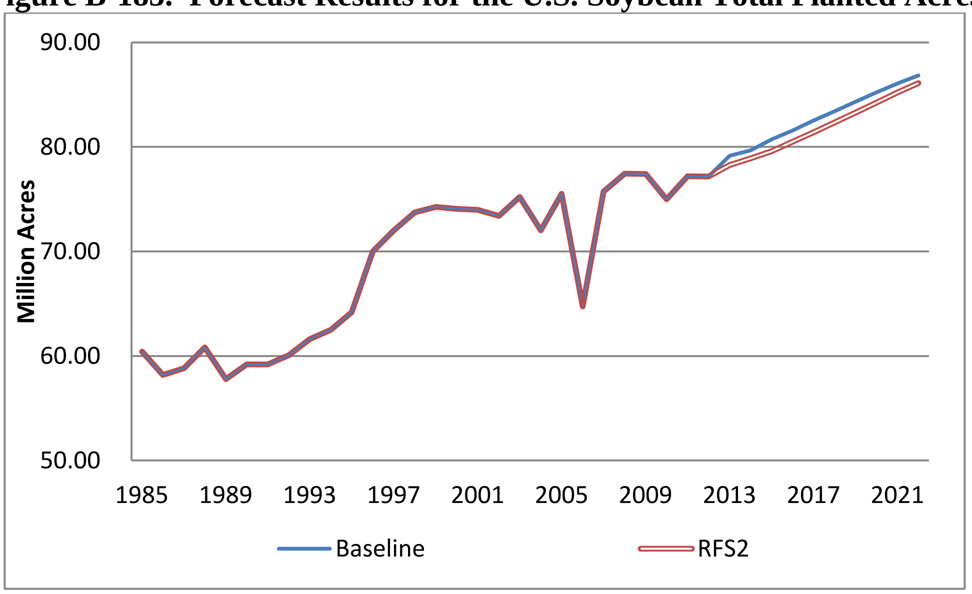


Figure B-186. Forecast Results for the U.S. Soybean Total Production

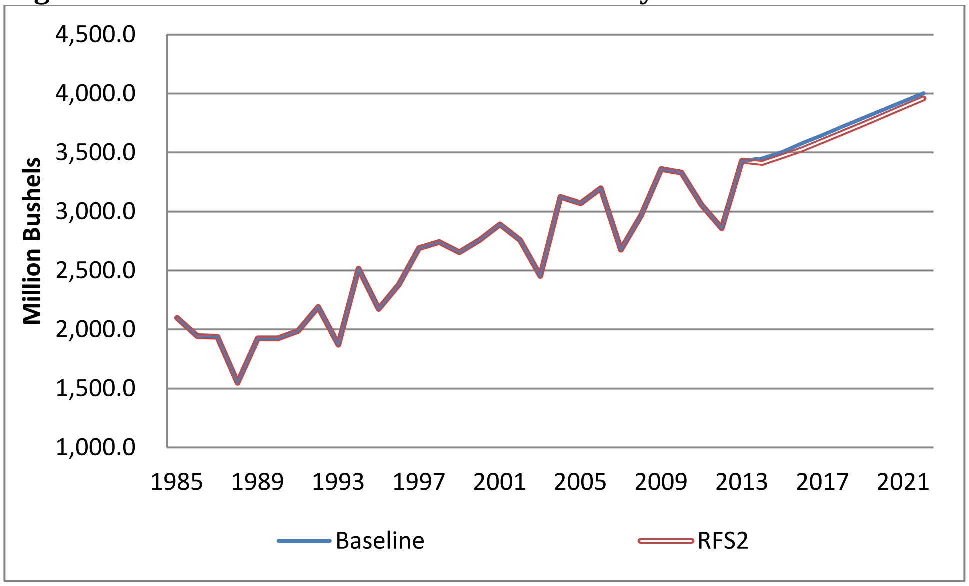
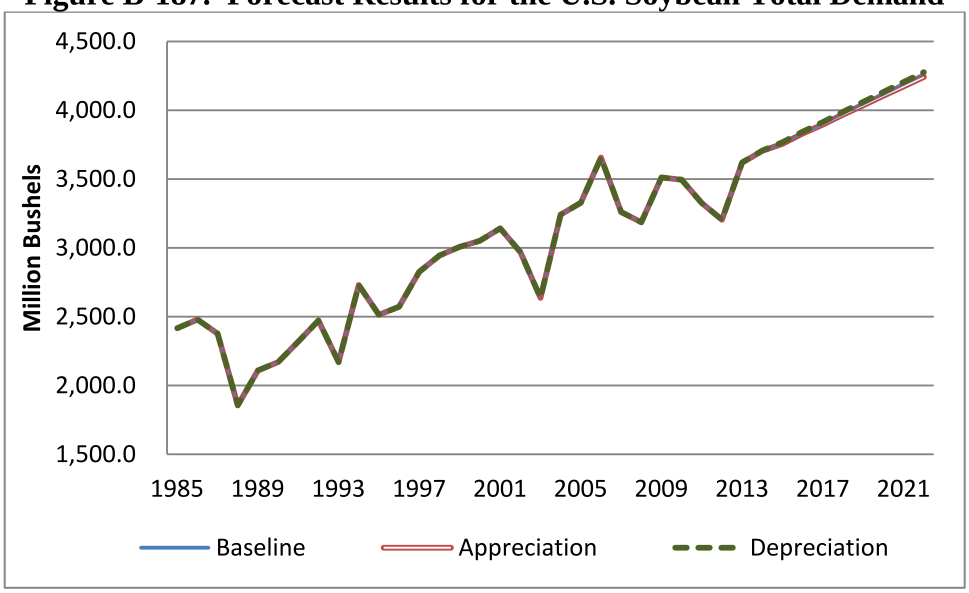


Figure B-187. Forecast Results for the U.S. Soybean Total Demand



Note: Total demand includes seed, feed, and residual, crushing, export demand, and ending stocks.

Figure B-188. Forecast Results for the U.S. Soybean Crushing Margins

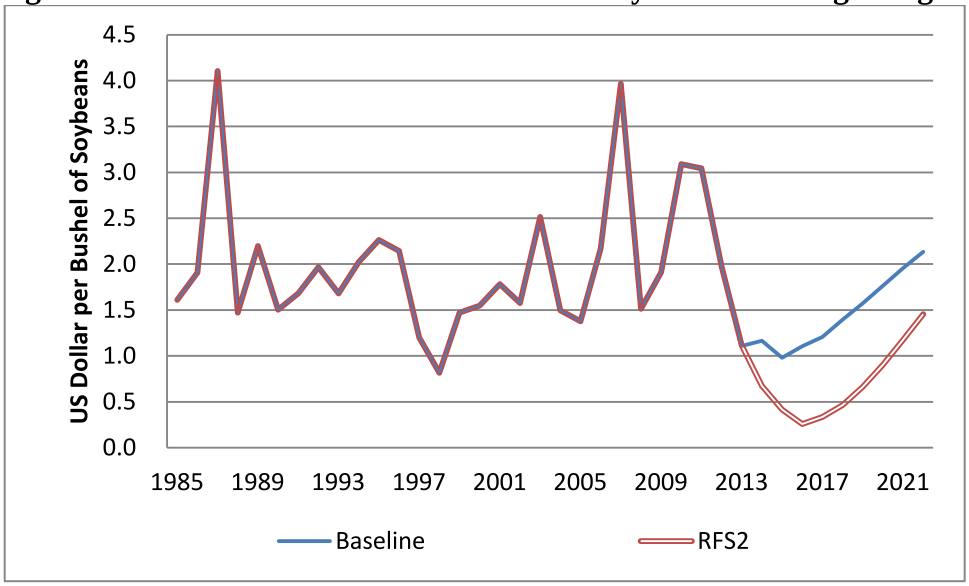


Figure B-189. Forecast Results for Regional Soybean ENRs

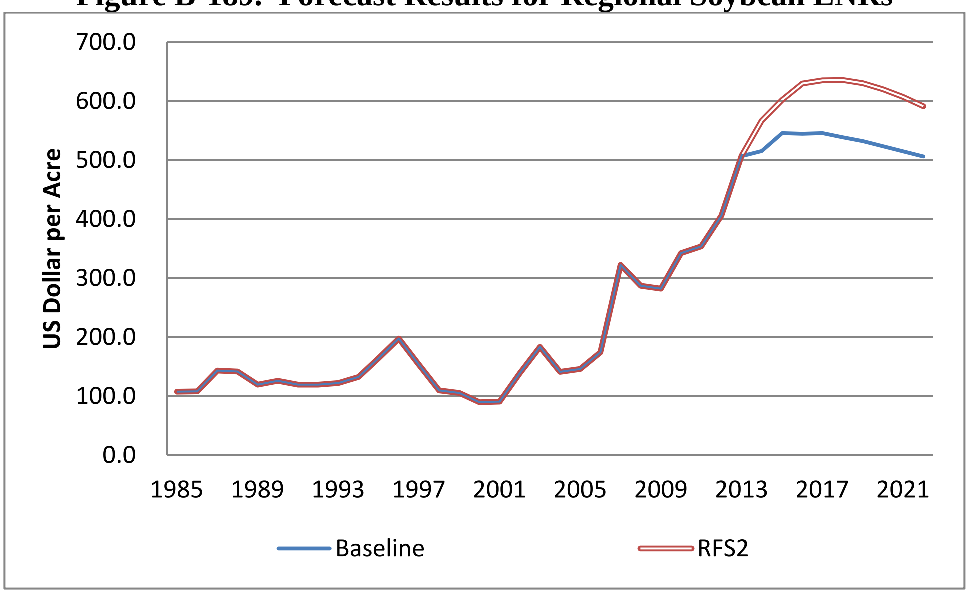


Figure B-190. Forecast Results for the U.S. Soybean Meal Price

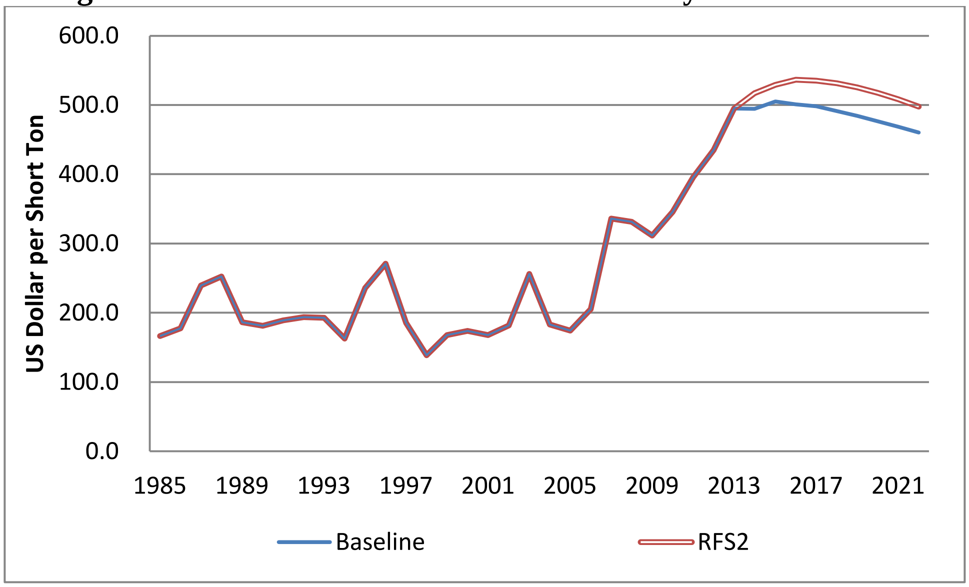


Figure B-191. Forecast Results for the U.S. Soybean Meal Total Production

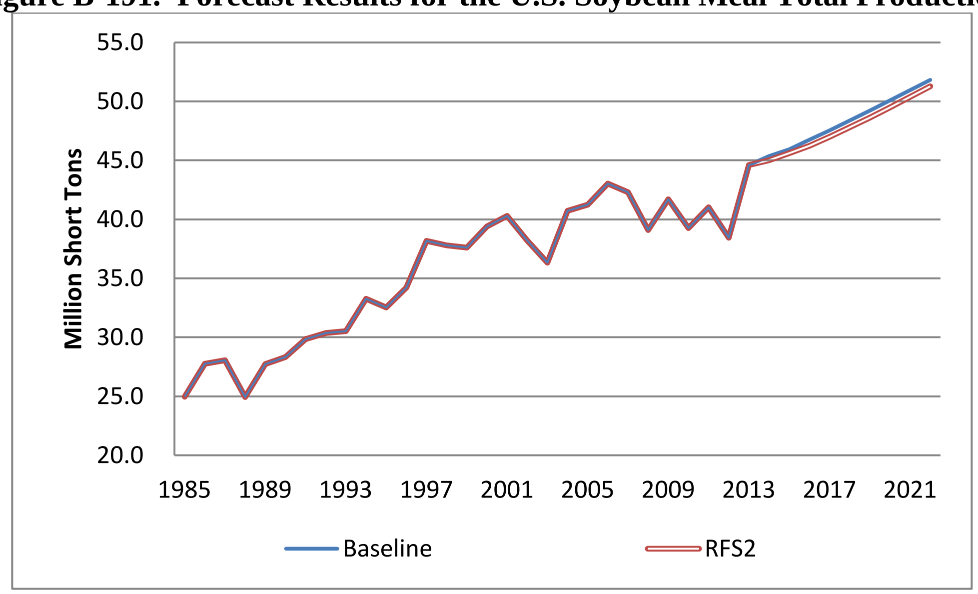
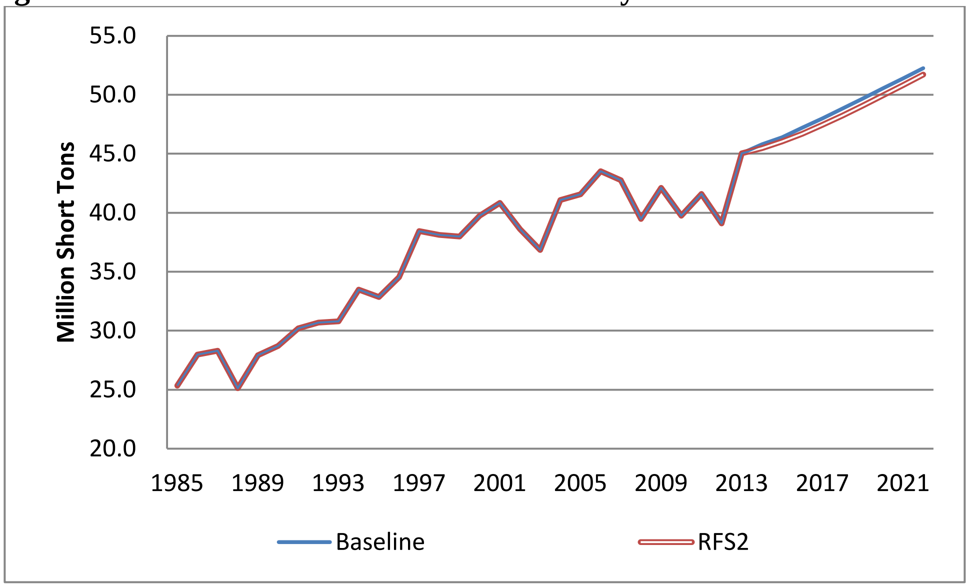


Figure B-192. Forecast Results for the U.S. Soybean Meal Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-193. Forecast Results for the U.S. Soybean Oil Price

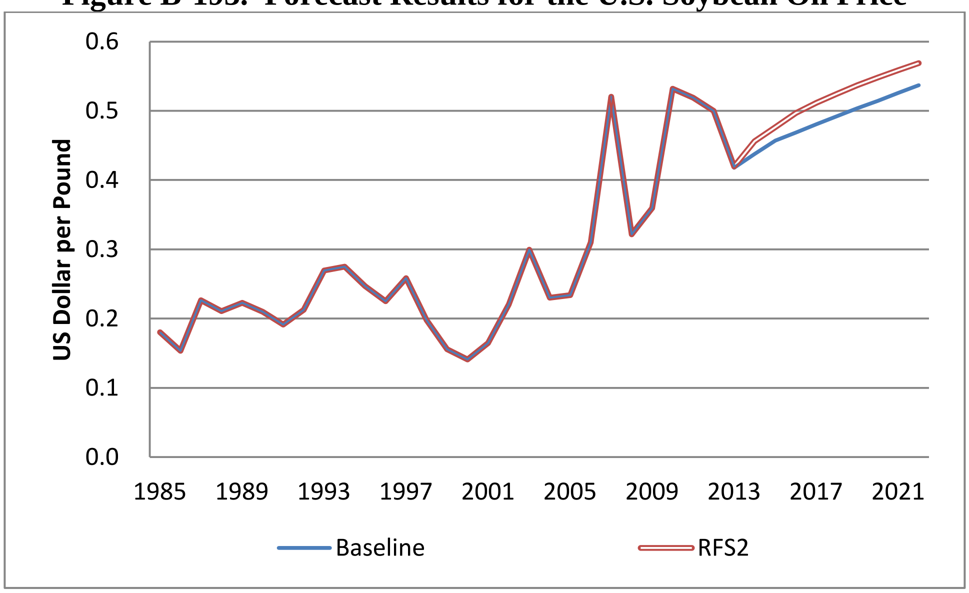


Figure B-194. Forecast Results for the U.S. Soybean Oil Total Production

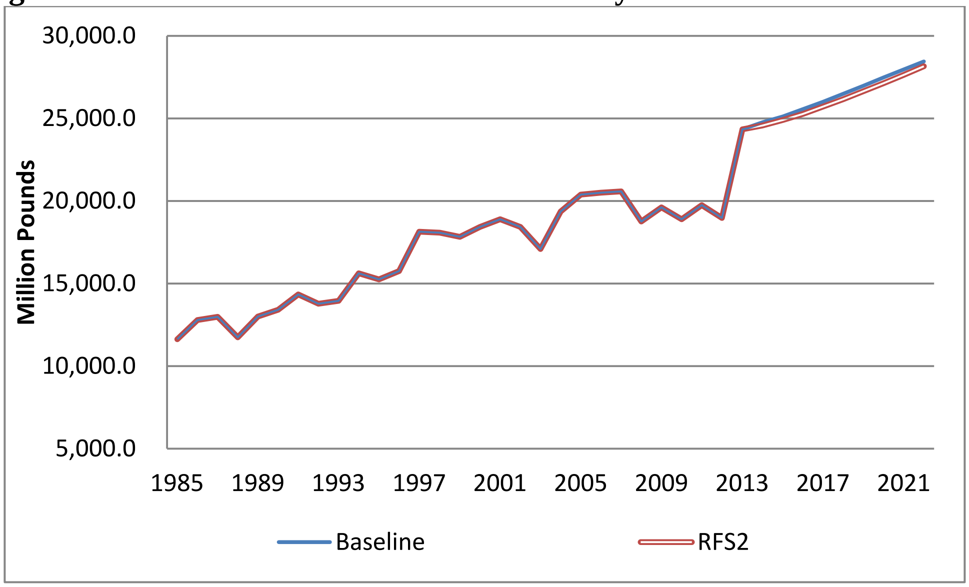
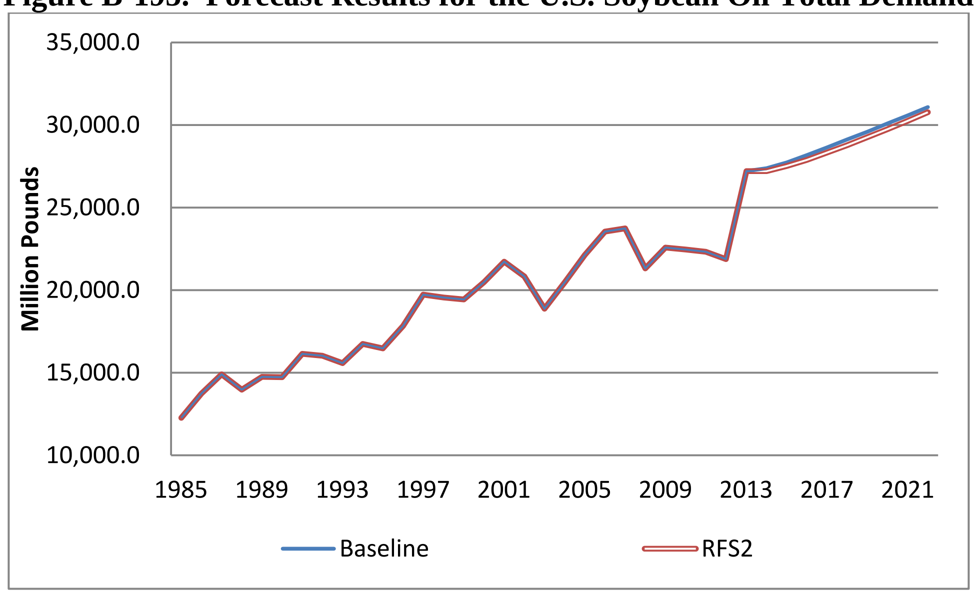


Figure B-195. Forecast Results for the U.S. Soybean Oil Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-196. Forecast Results for the U.S. Wheat Price

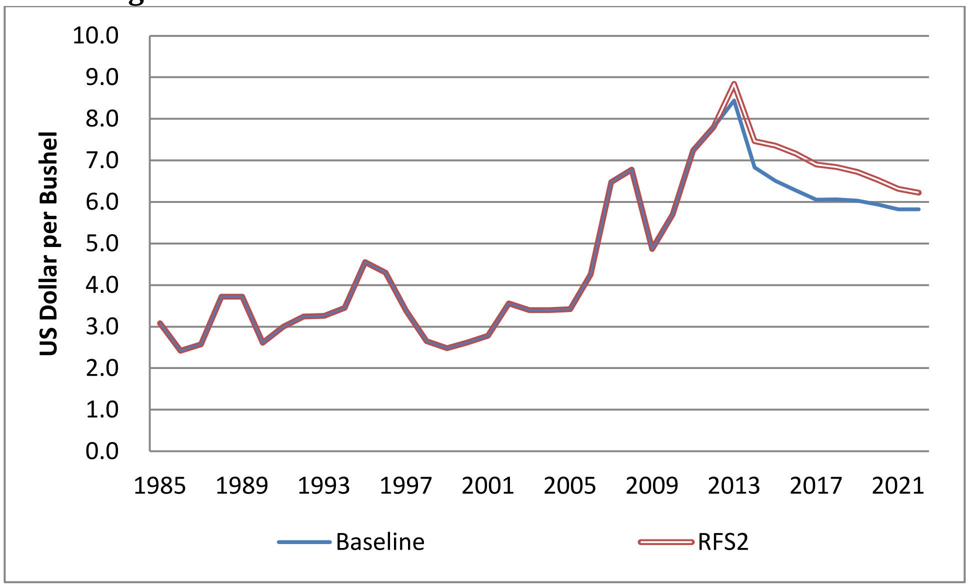


Figure B-197. Forecast Results for the U.S. Wheat Total Planted Acres

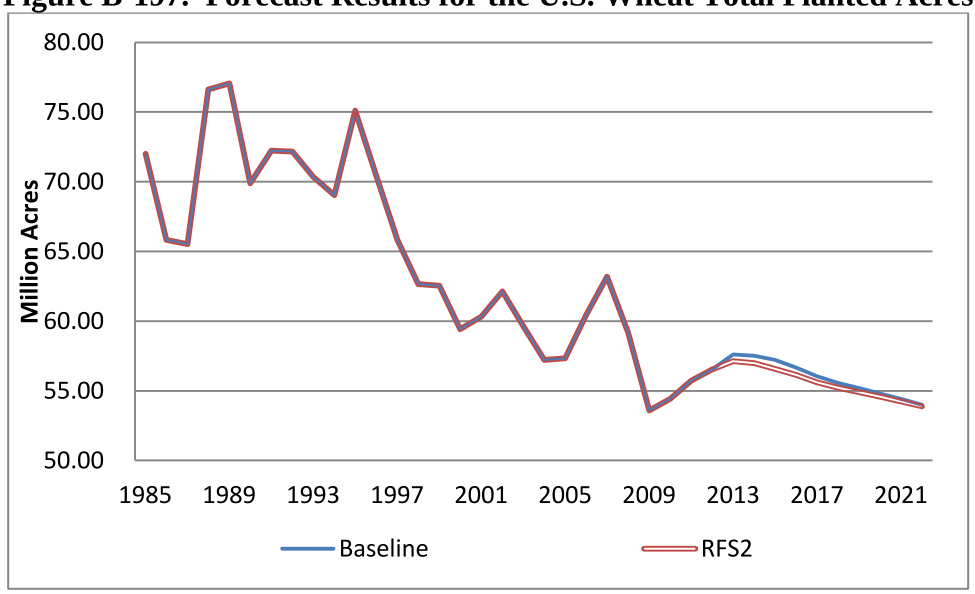


Figure B-198. Forecast Results for the U.S. Wheat Total Production

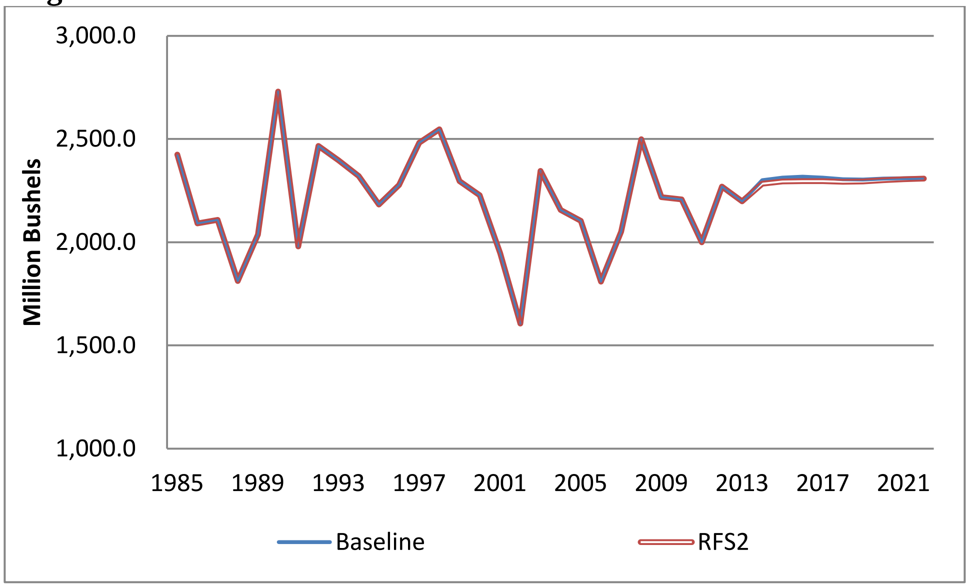
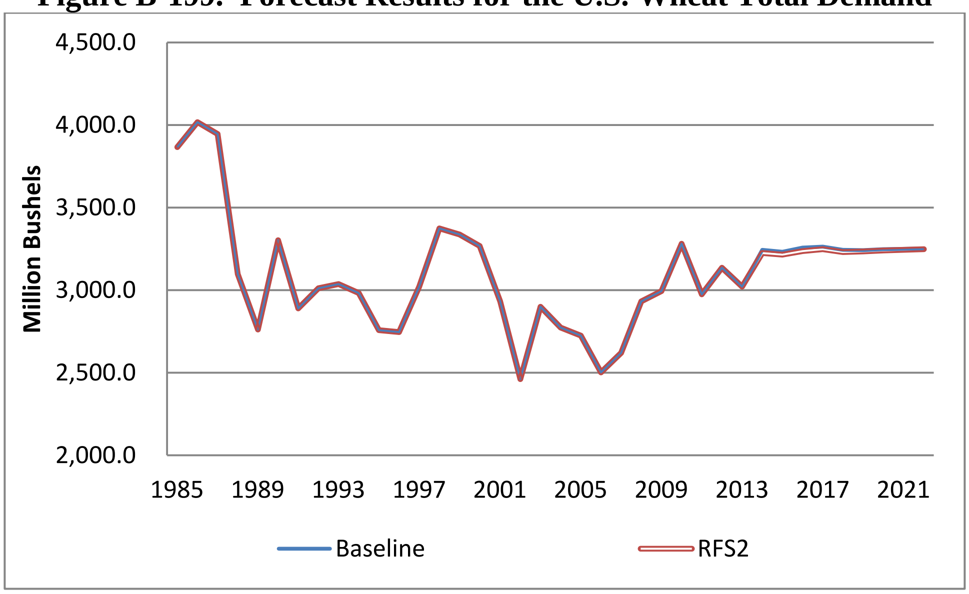


Figure B-199. Forecast Results for the U.S. Wheat Total Demand



Note: Total demand includes seed, feed and residual, food, export demand.

Figure B-200. Forecast Results for Regional Wheat ENRs

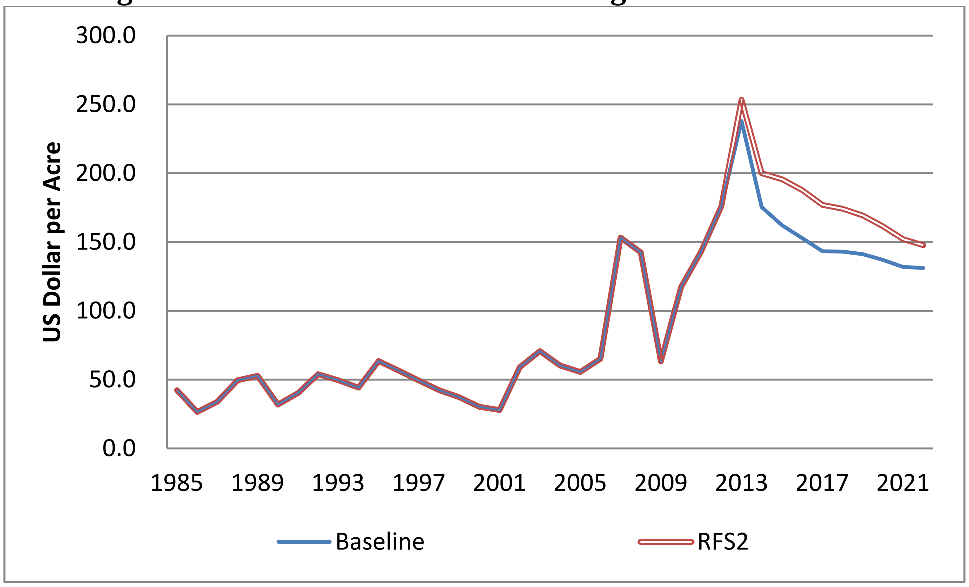


Figure B-201. Forecast Results for the U.S. Peanut Price

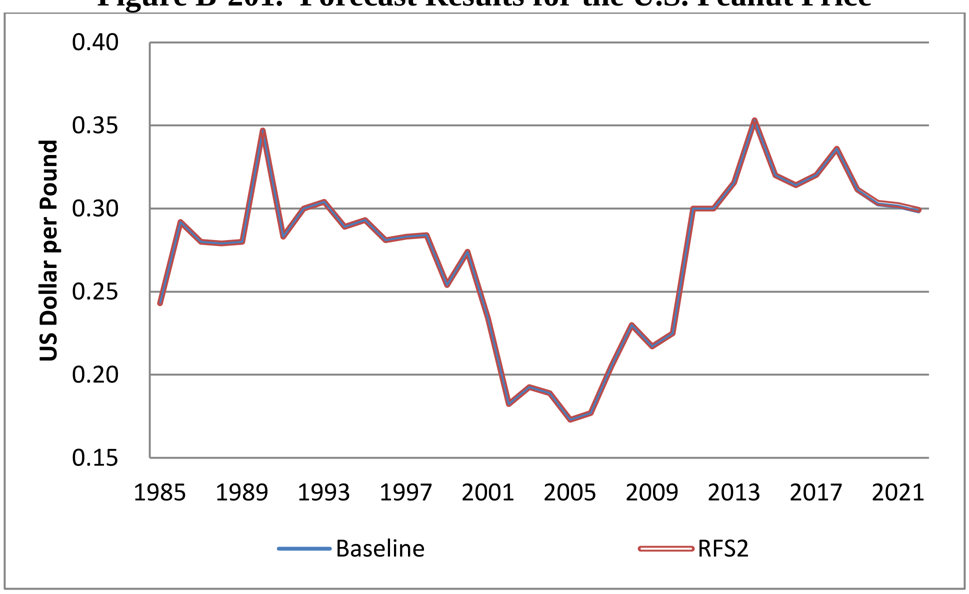


Figure B-202. Forecast Results for the U.S. Peanut Total Planted Acres

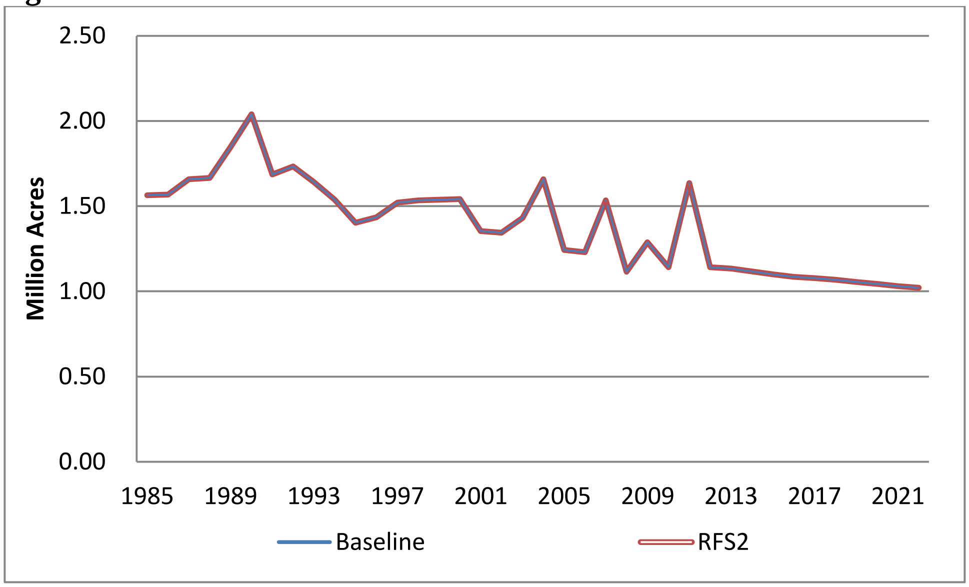


Figure B-203. Forecast Results for the U.S. Peanut Total Production

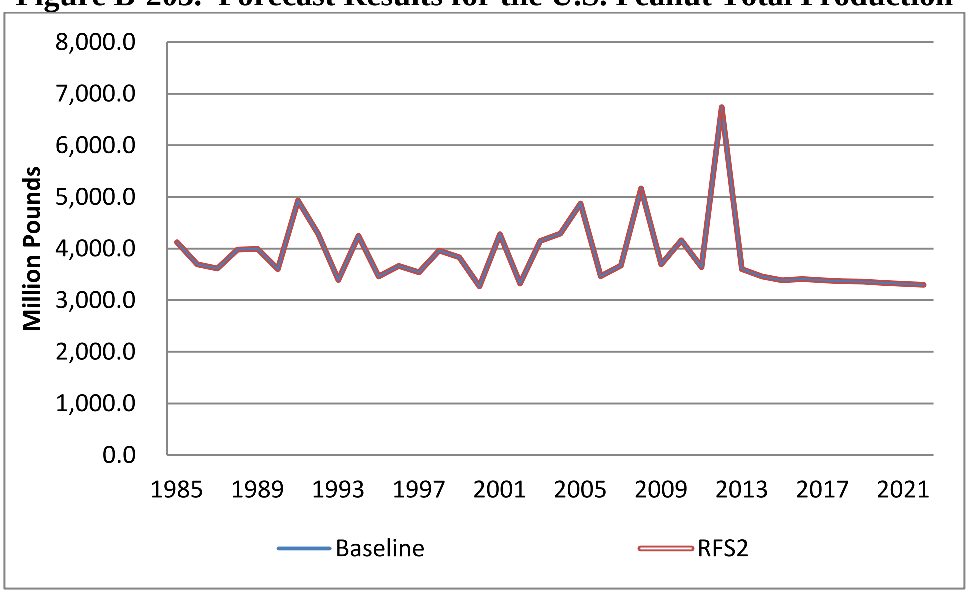
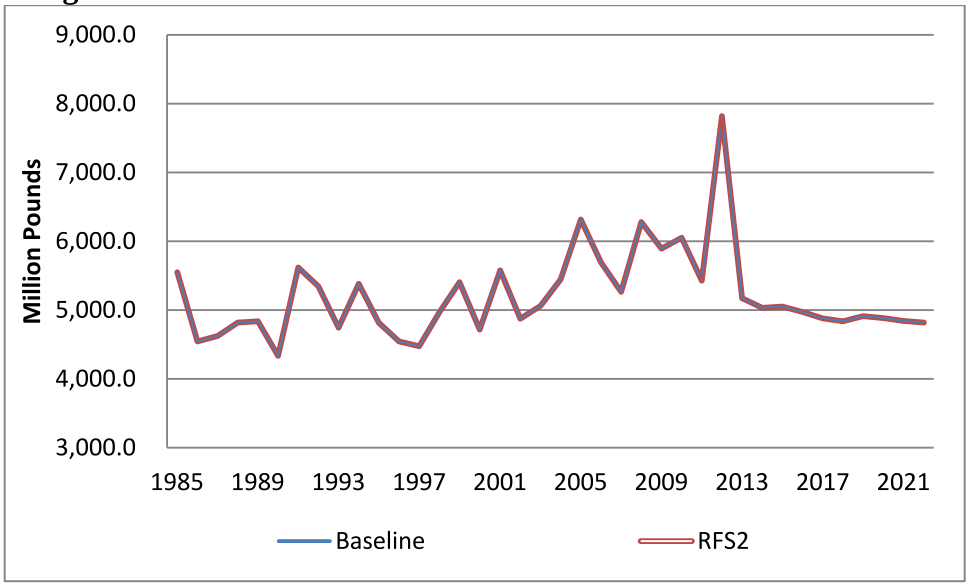


Figure B-204. Forecast Results for the U.S. Peanut Total Demand



Note: Total demand includes seed, loss, shrinkage, and residual, crushing, export demand, and ending stocks.

Figure B-205. Forecast Results for Regional Peanut ENRs

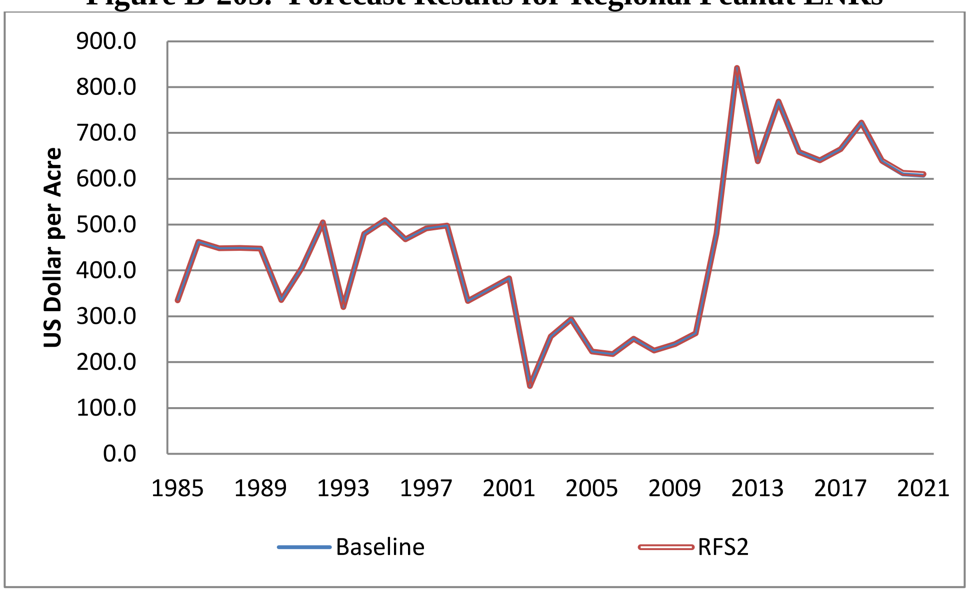


Figure B-206. Forecast Results for the U.S. Ethanol Price

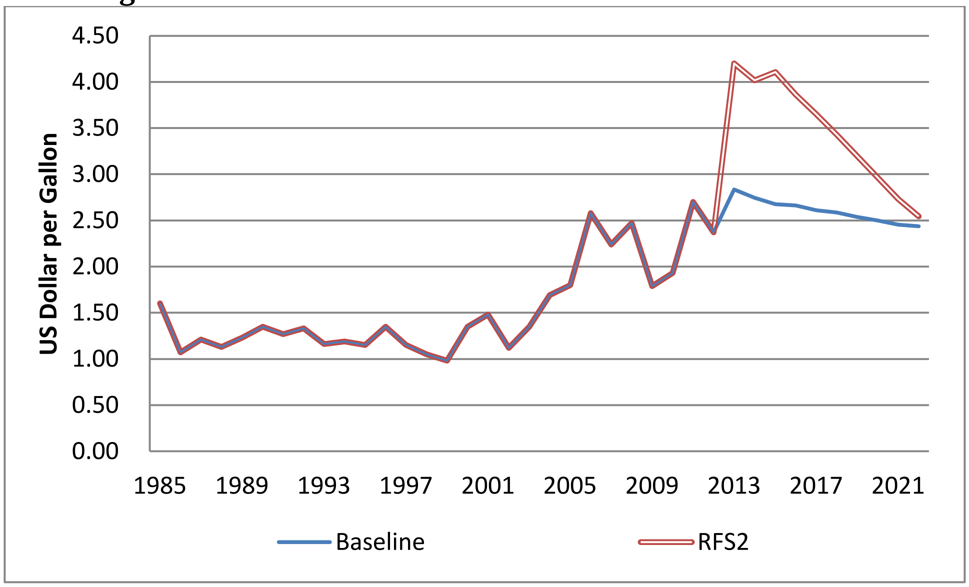


Figure B-207. Forecast Results for the U.S. Ethanol Total Production

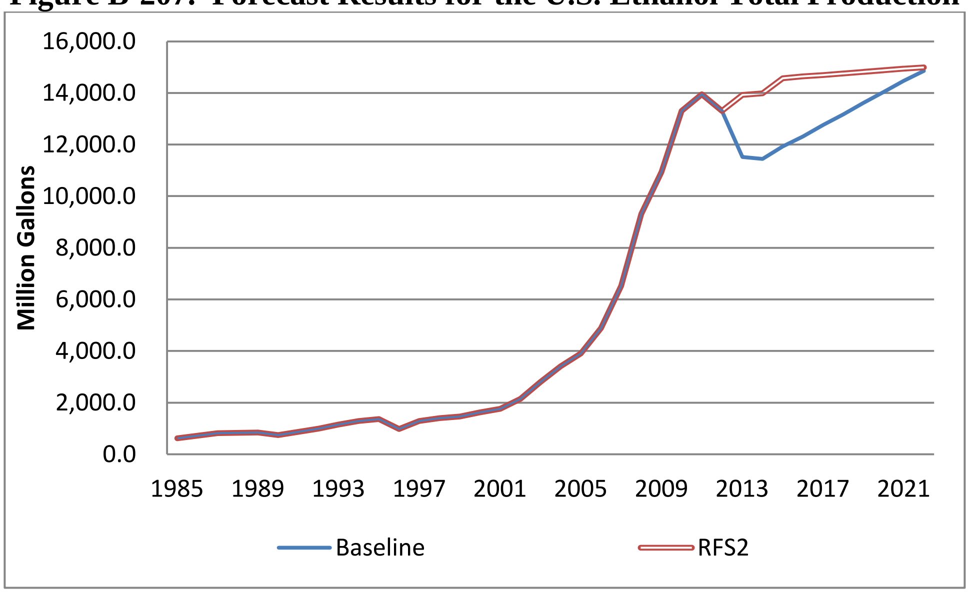
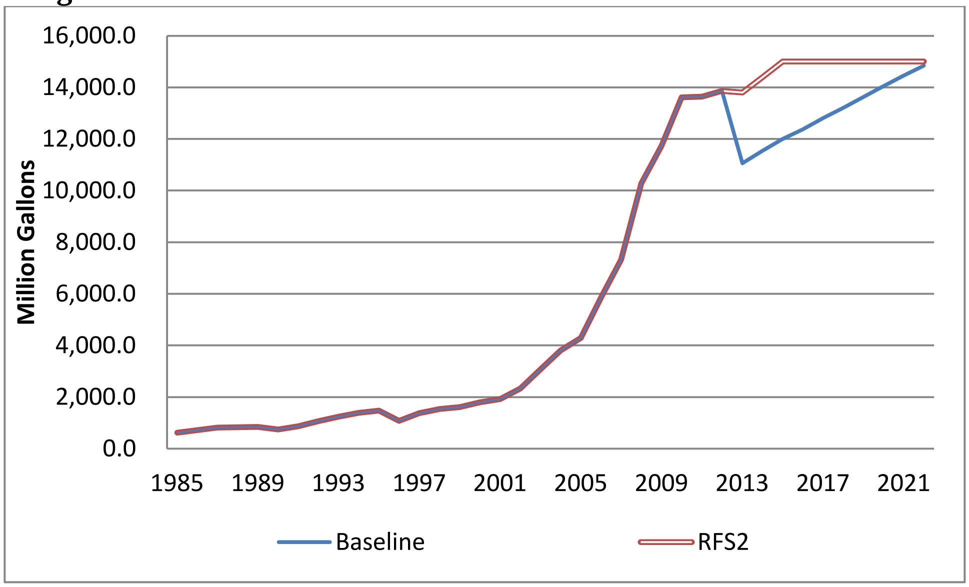


Figure B-208. Forecast Results for the U.S. Ethanol Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-209. Forecast Results for the U.S. Ethanol Dry Milling Operating Margins

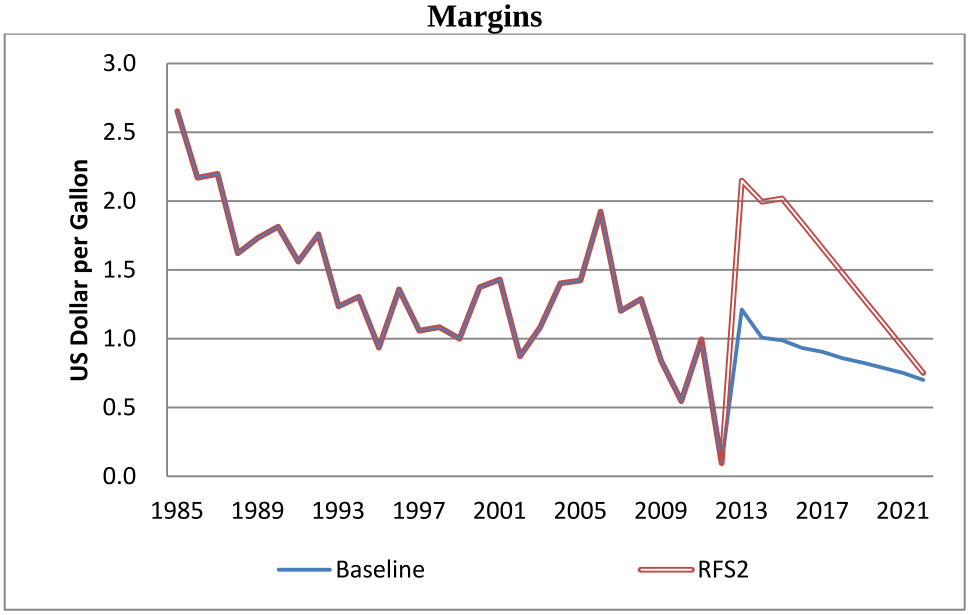


Figure B-210. Forecast Results for the U.S. Ethanol Wet Milling Operating Margins

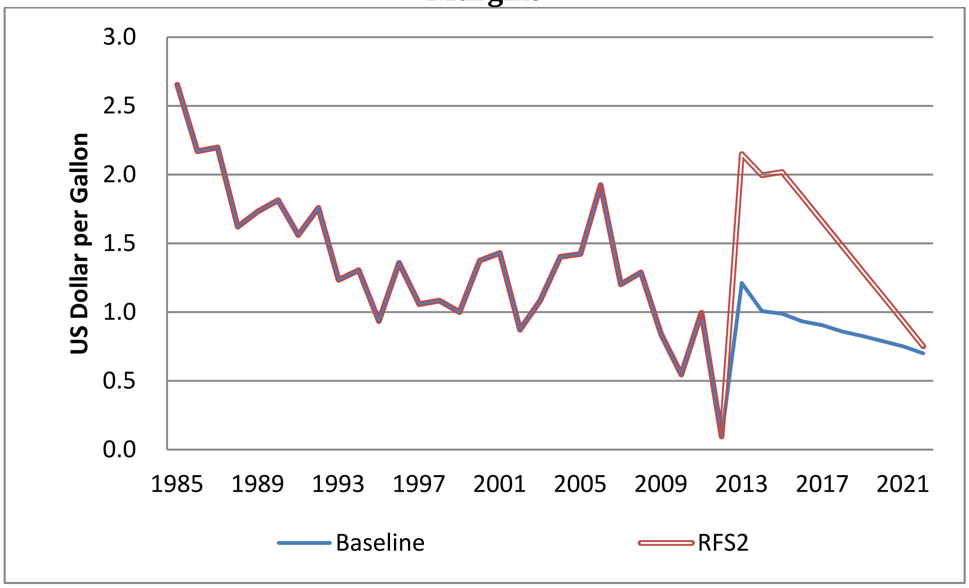


Figure B-211. Forecast Results for the U.S. Biodiesel Price

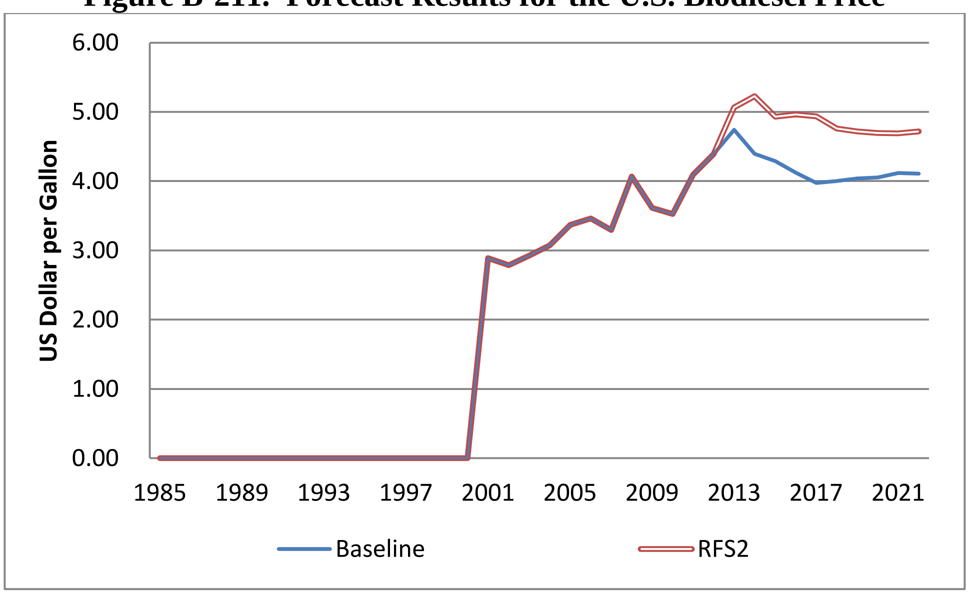


Figure B-212. Forecast Results for the U.S. Biodiesel Total Production

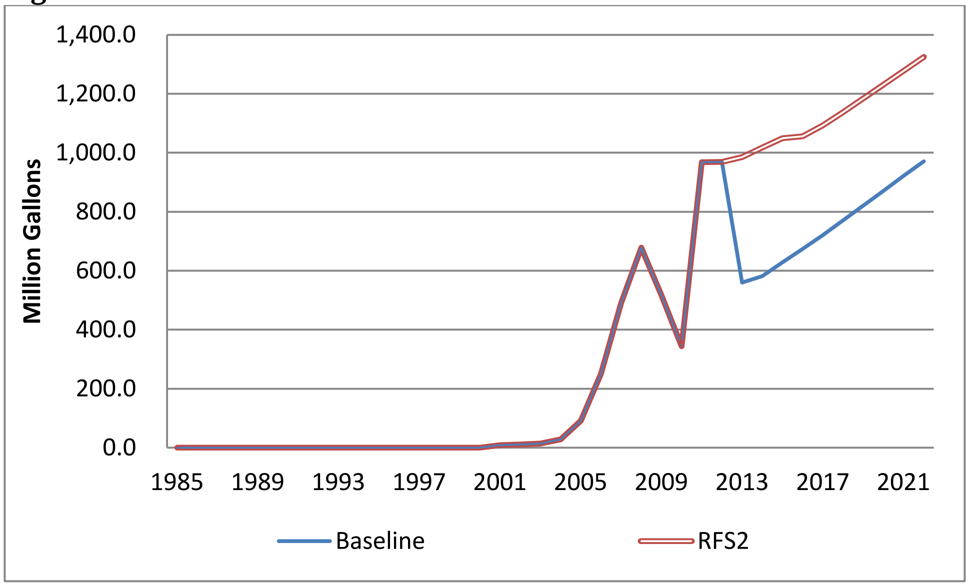
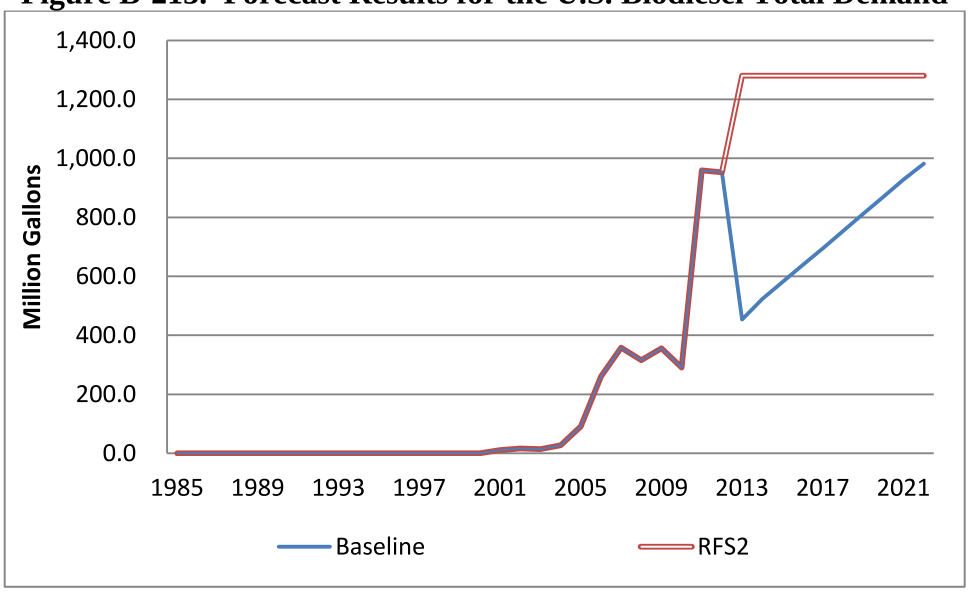


Figure B-213. Forecast Results for the U.S. Biodiesel Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-214. Forecast Results for the U.S. biodiesel Operating Margins

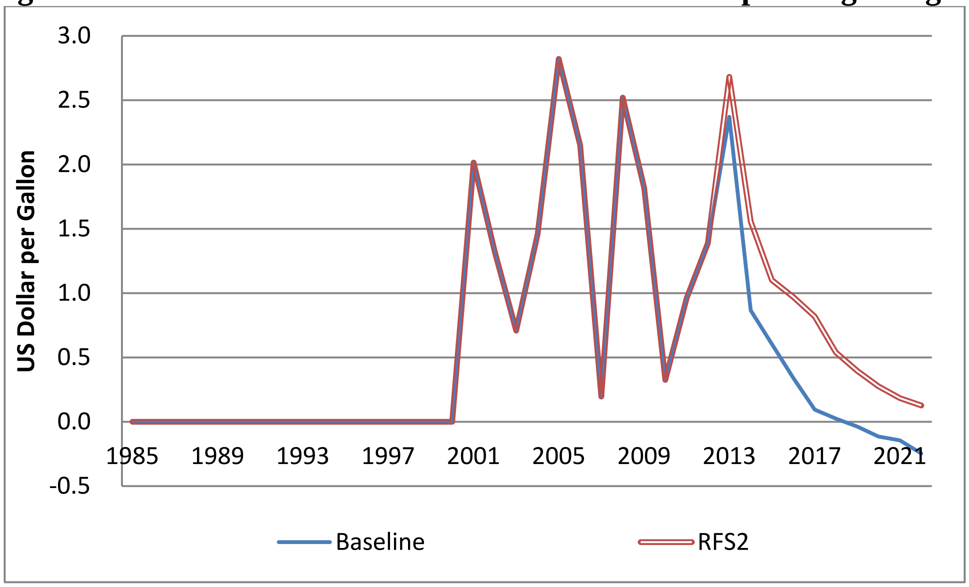
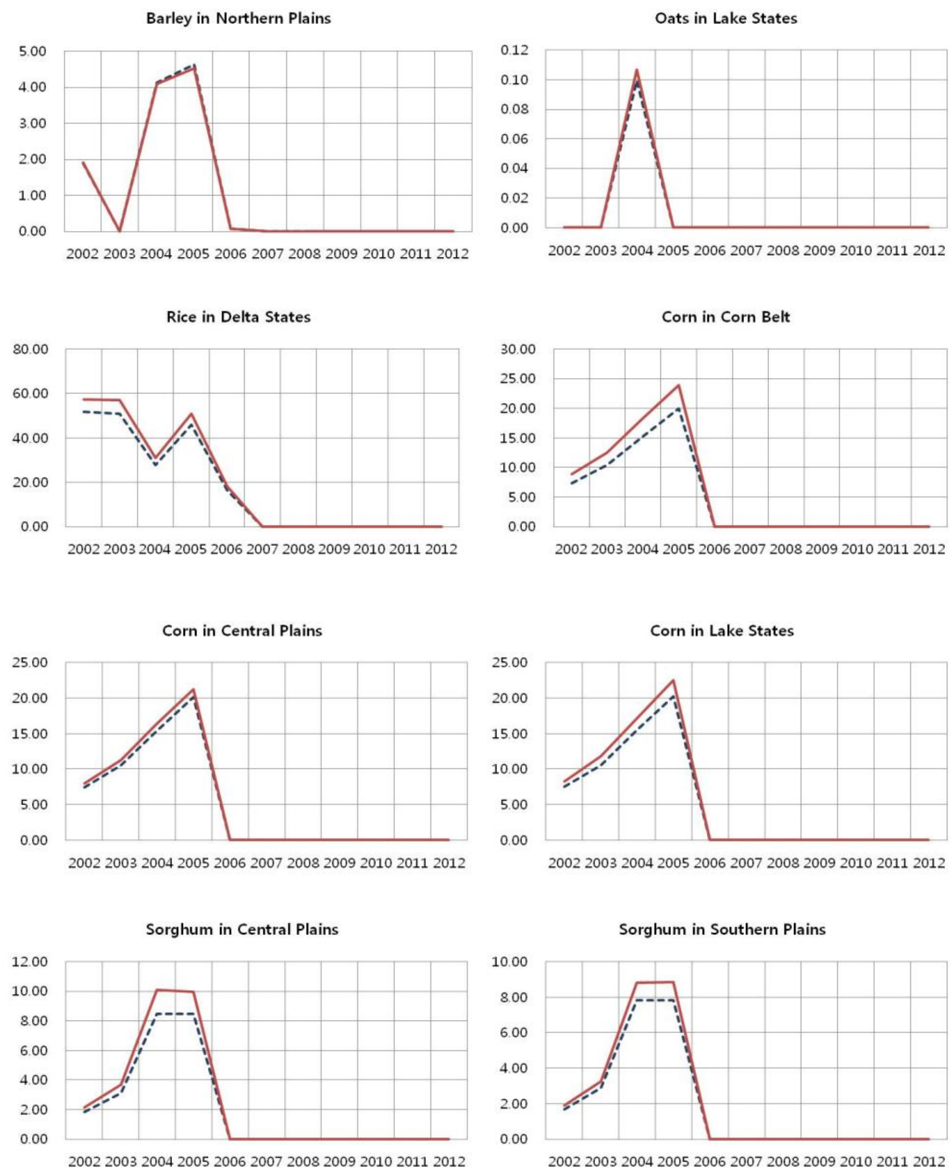


Figure B-215. Comparison Results for Hypothetical PLC/ARC Payments using Regional and Sample County Data



Note: 1) All of the units are U.S. dollar per acre.

2) Payments equals to an average of PLC and ARC payments.

3) Dashed and solid lines represent the program payments with regional data and weighted average payments with county data.

Figure B-215 (Continued)

Note: 1) All of the units are U.S. dollar per acre.

2) Payments equals to an average of PLC and ARC payments.

3) Dashed and solid lines represent the program payments with regional data and weighted average payments with county data.

Figure B-216. Forecast Results for the U.S. Corn Price

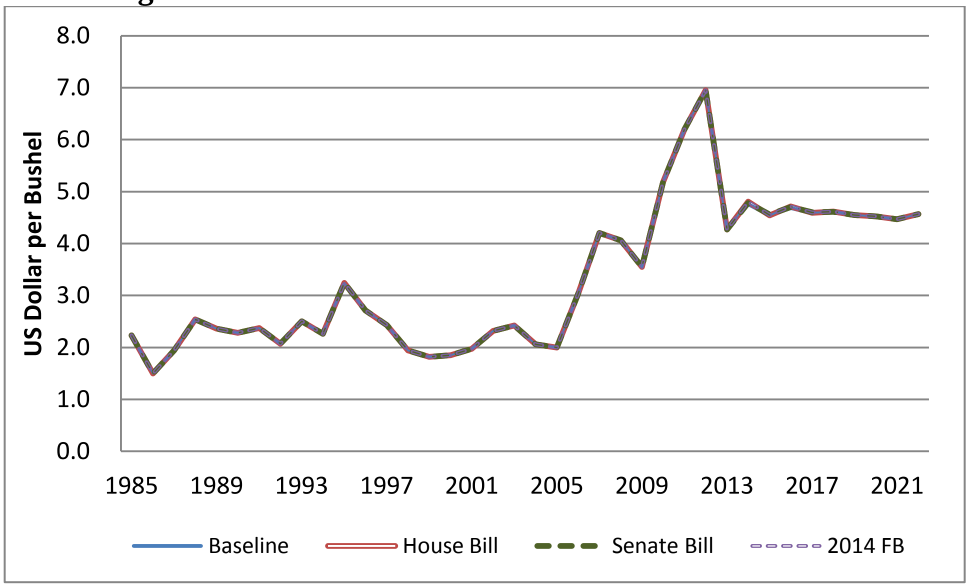


Figure B-217. Forecast Results for the U.S. Corn Total Planted Acres

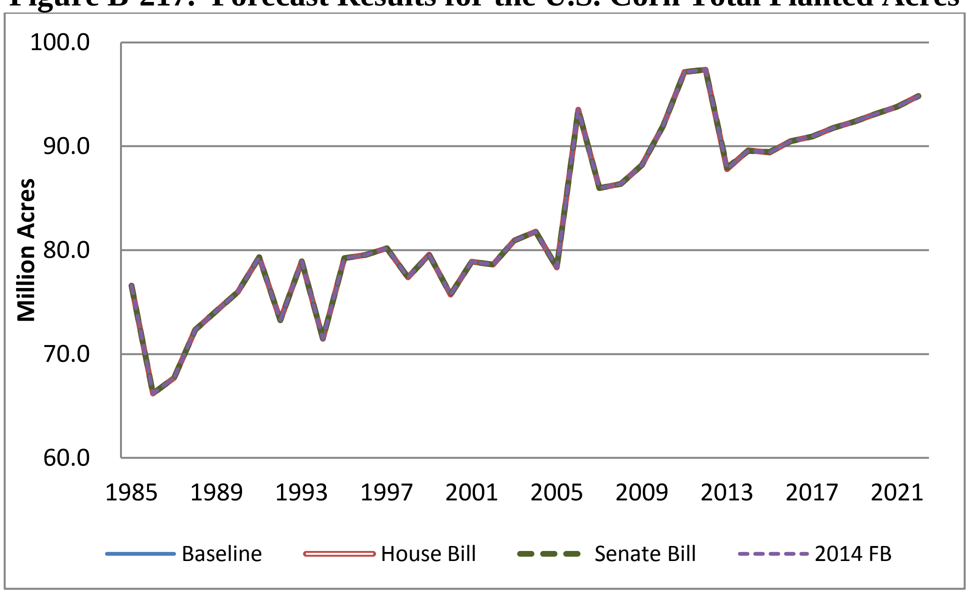


Figure B-218. Forecast Results for the U.S. Corn Total Production

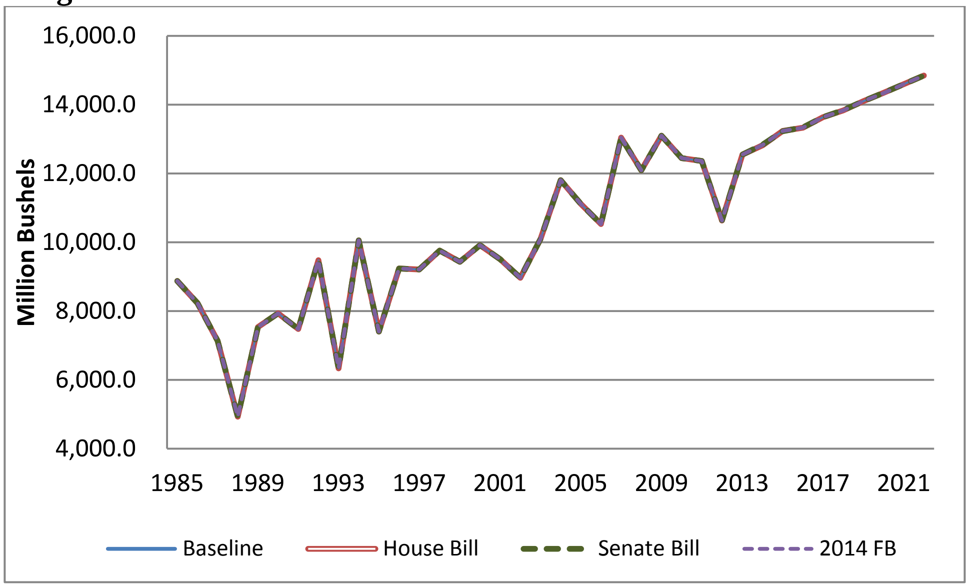
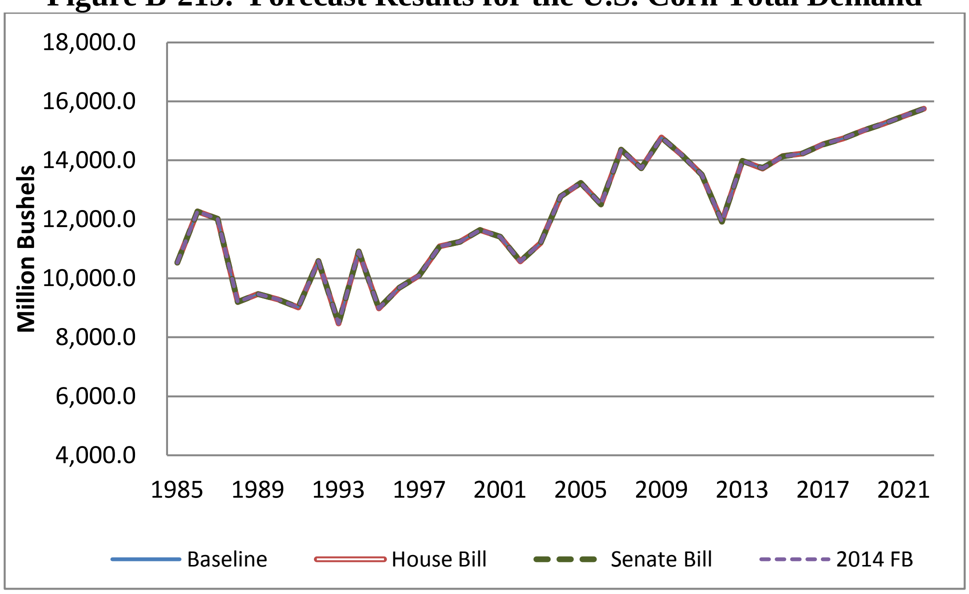


Figure B-219. Forecast Results for the U.S. Corn Total Demand



Note: Total demand includes seed, feed and residual, food and industrial, alcohol (energy), export demand, and ending stocks.

Figure B-220. Forecast Results for Regional Corn ENRs

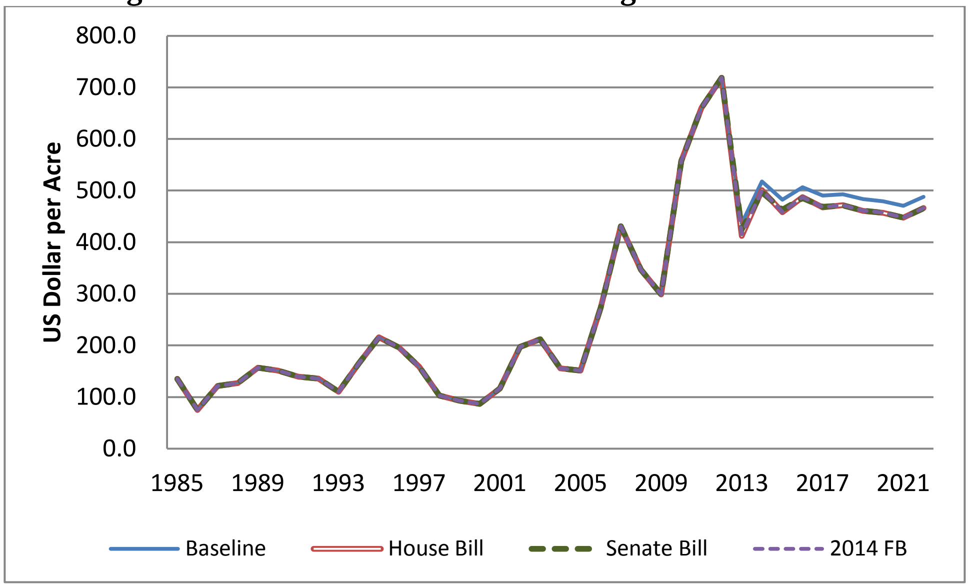


Figure B-221. Forecast Results for the U.S. Barley Price

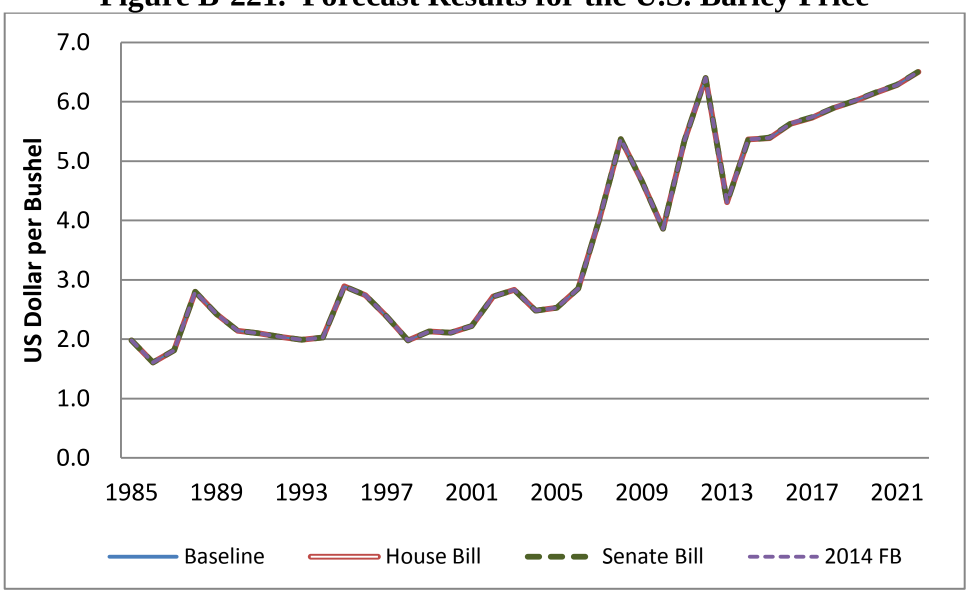


Figure B-222. Forecast Results for the U.S. Barley Total Planted Acres

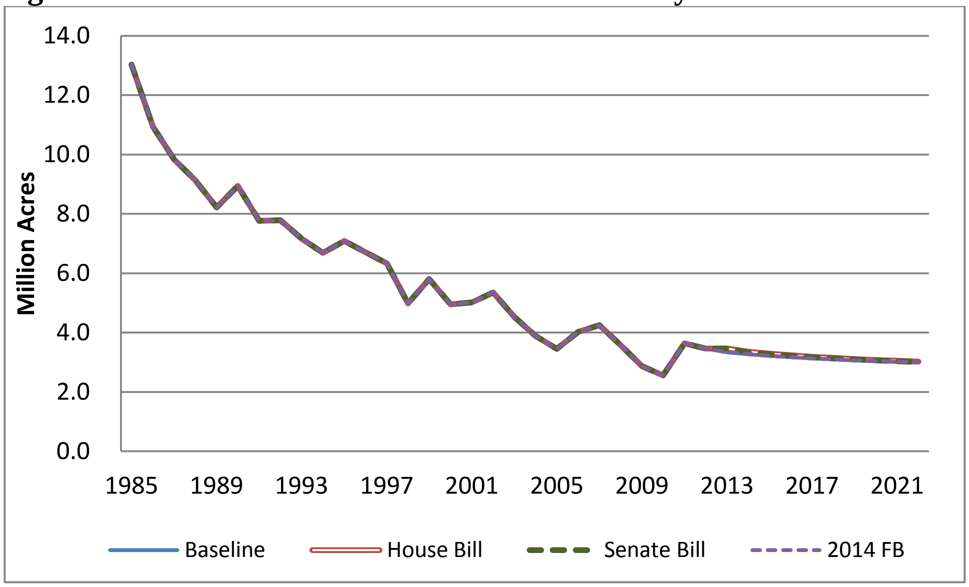


Figure B-223. Forecast Results for the U.S. Barley Total Production

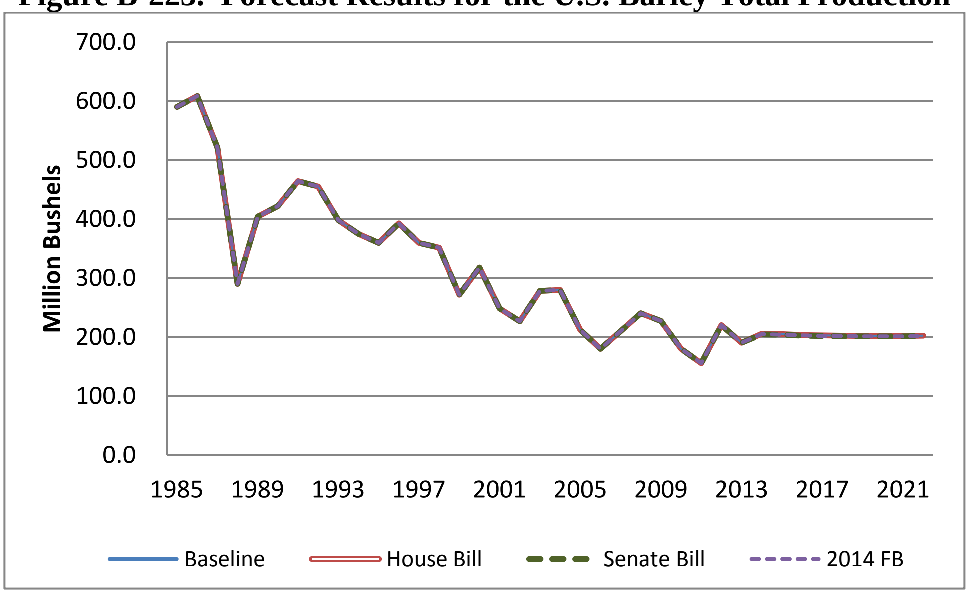
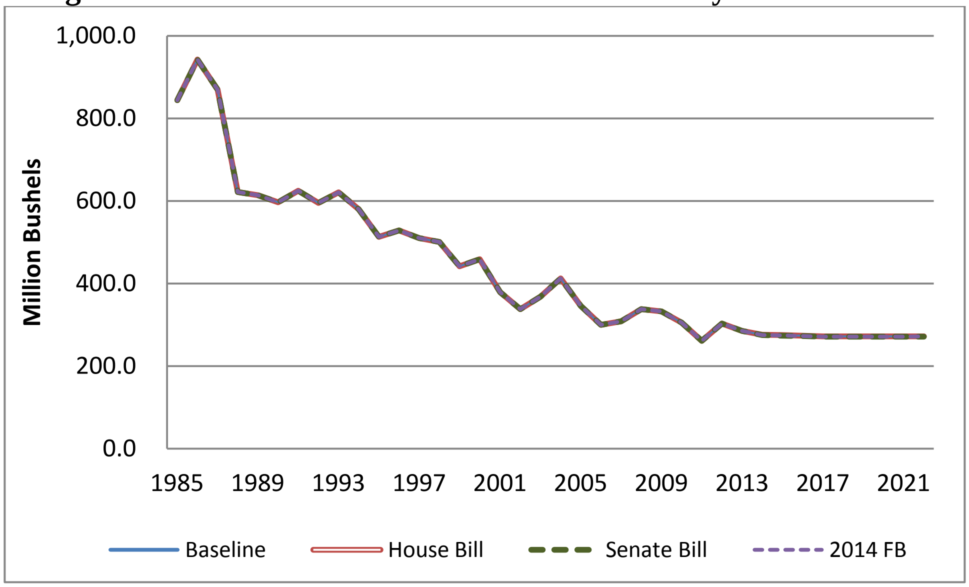


Figure B-224. Forecast Results for the U.S. Barley Total Demand



Note: Total demand includes seed, feed, food, export demand, and ending stocks.

Figure B-225. Forecast Results for Regional Barley ENRs

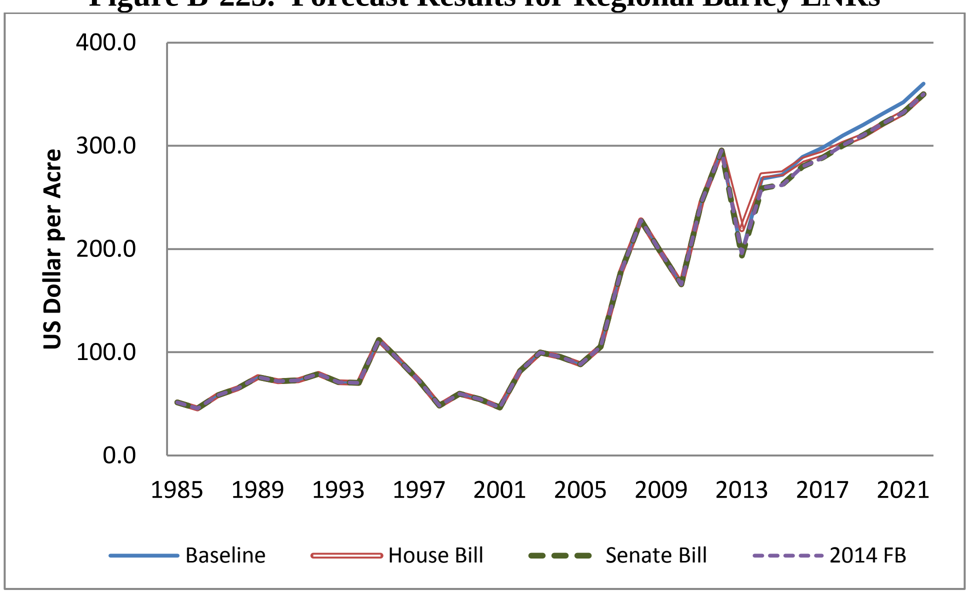


Figure B-226. Forecast Results for the U.S. Cotton Price

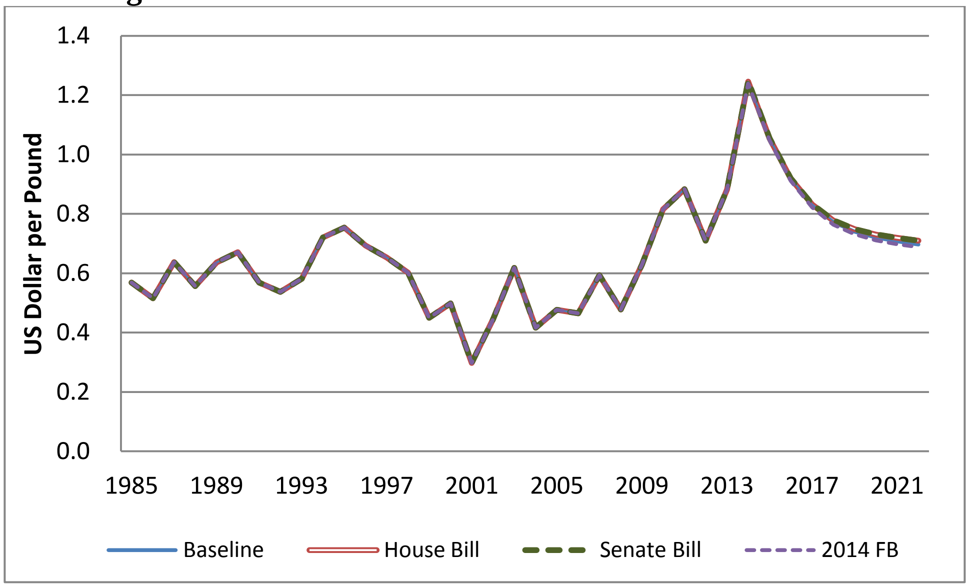


Figure B-227. Forecast Results for the U.S. Cotton Total Planted Acres

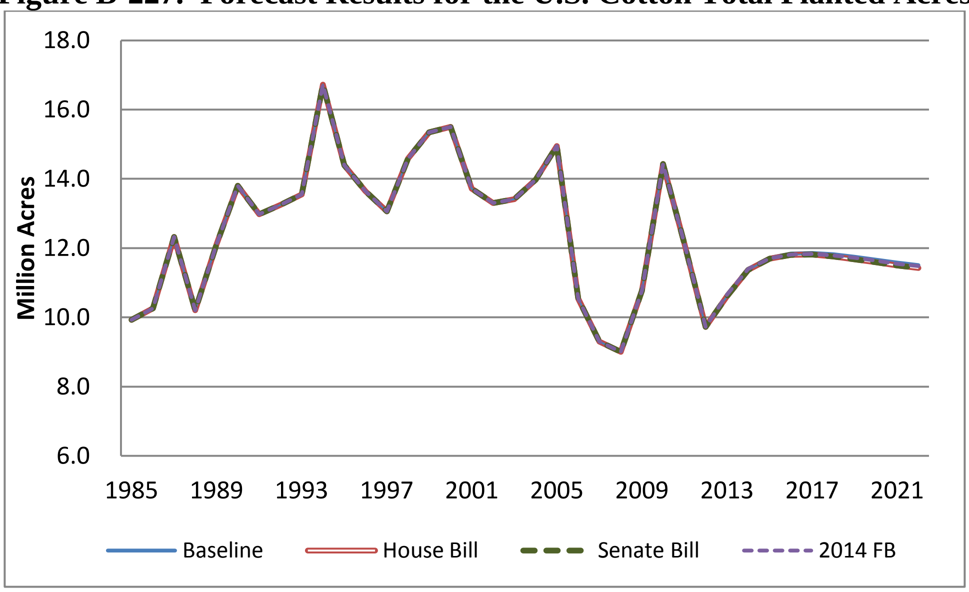


Figure B-228. Forecast Results for the U.S. Cotton Total Production

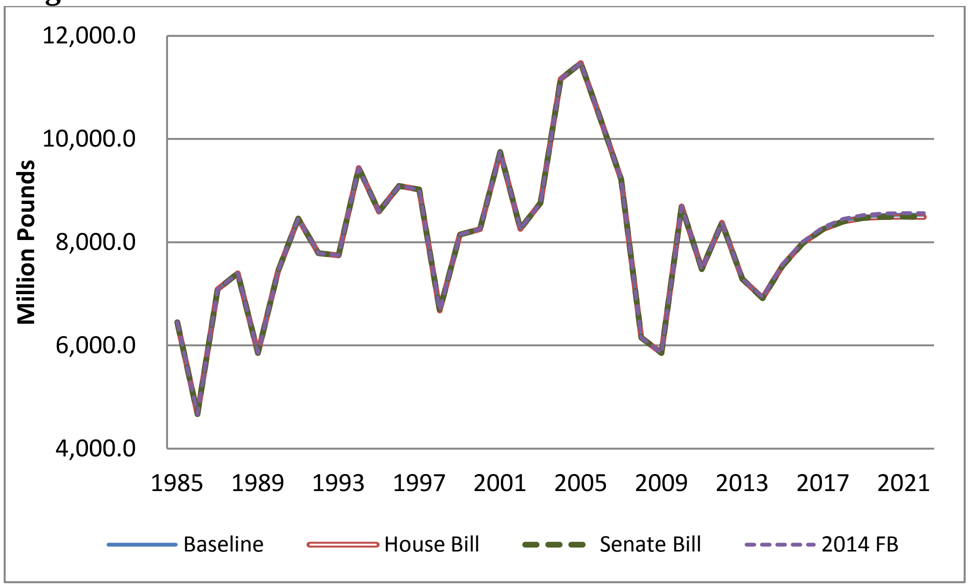
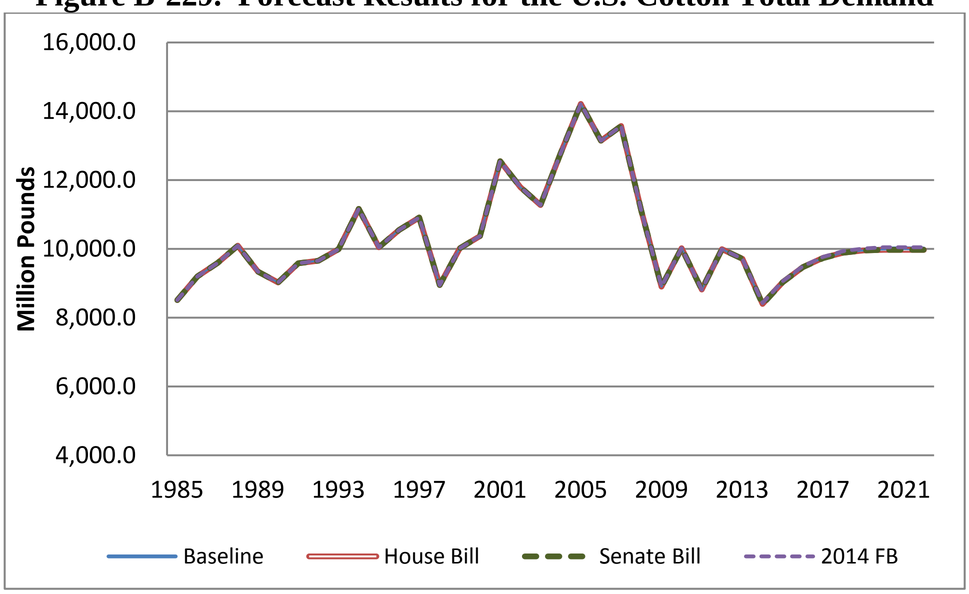


Figure B-229. Forecast Results for the U.S. Cotton Total Demand



Note: Total demand includes milling, export demand, and ending stocks.

Figure B-230. Forecast Results for Regional Cotton ENRs

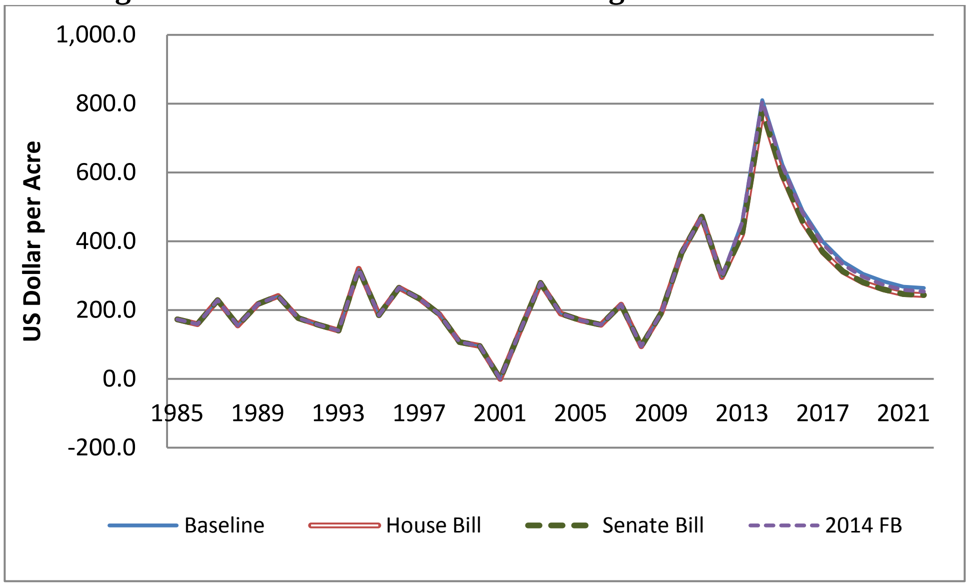


Figure B-231. Forecast Results for the U.S. Oat price

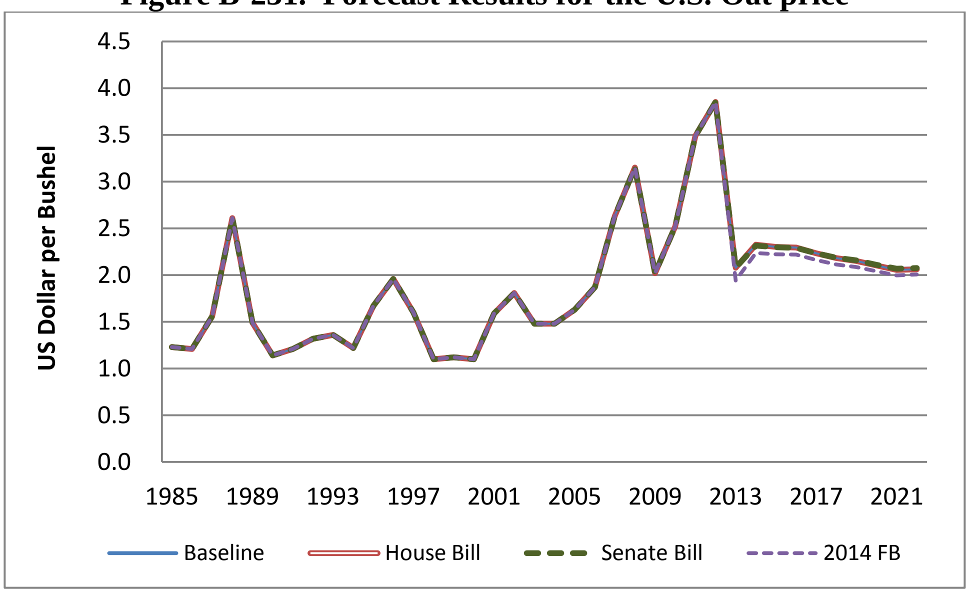


Figure B-232. Forecast Results for the U.S. Oats Total Planted Acres

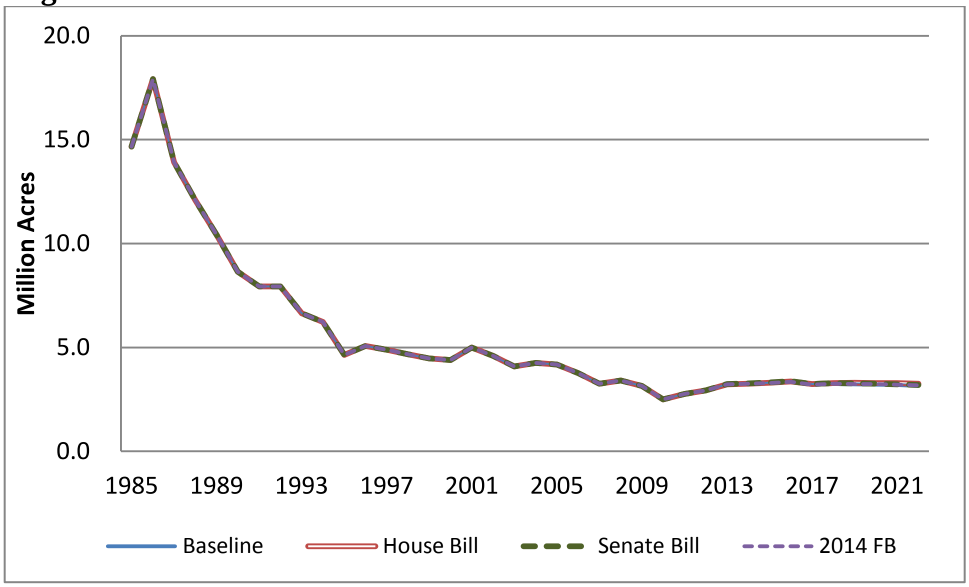


Figure B-233. Forecast Results for the U.S. Oats Total Production

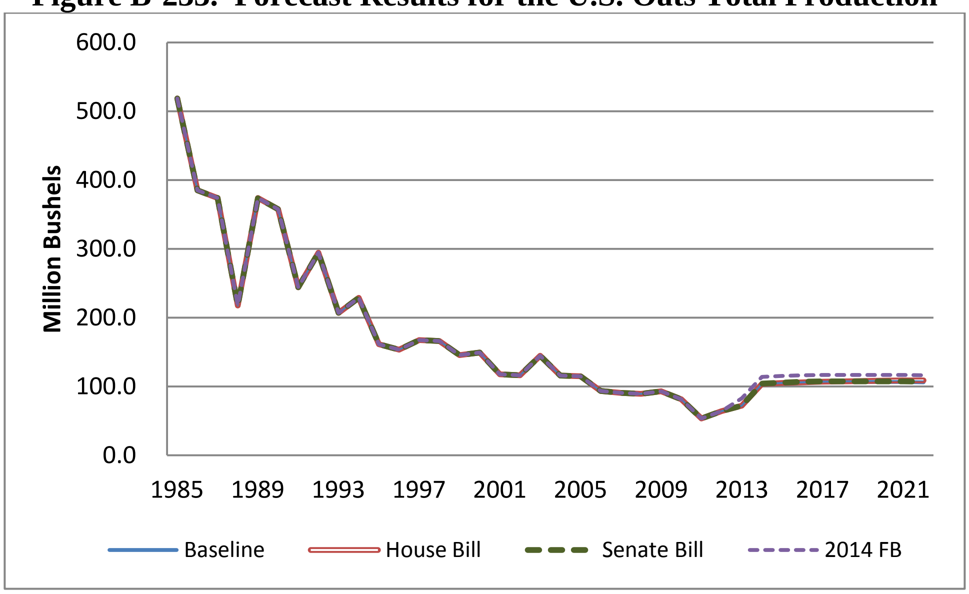
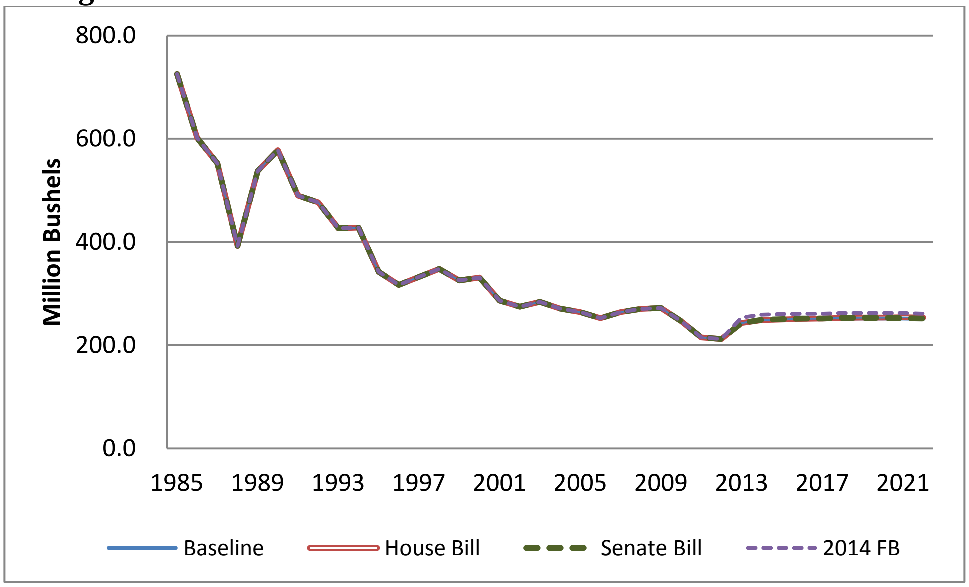


Figure B-234. Forecast Results for the U.S. Oats Total Demand



Note: Total demand includes seed, feed, food, export demand, and ending stocks.

Figure B-235. Forecast Results for Regional Oat ENRs

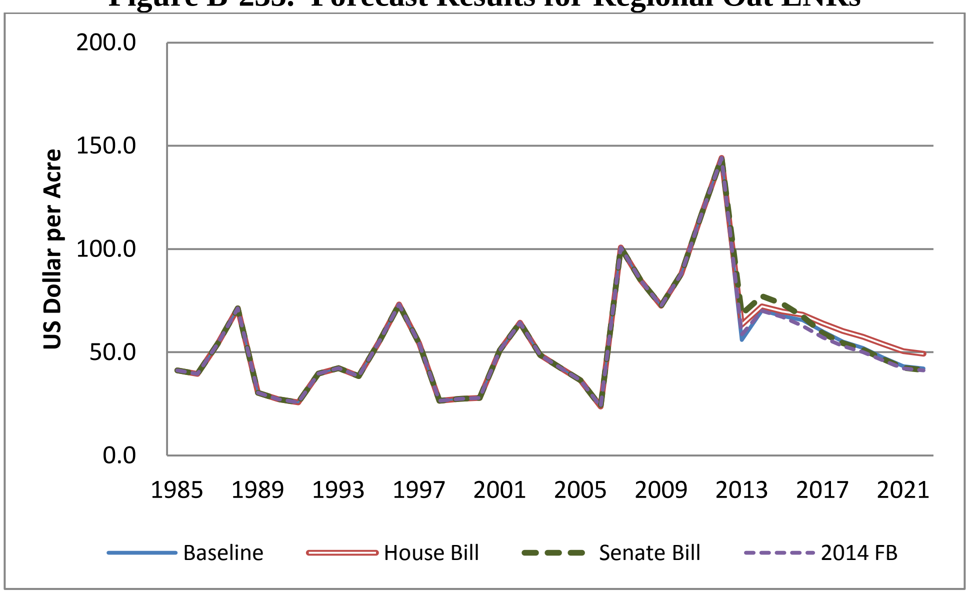


Figure B-236. Forecast Results for the U.S. LG Rice Price

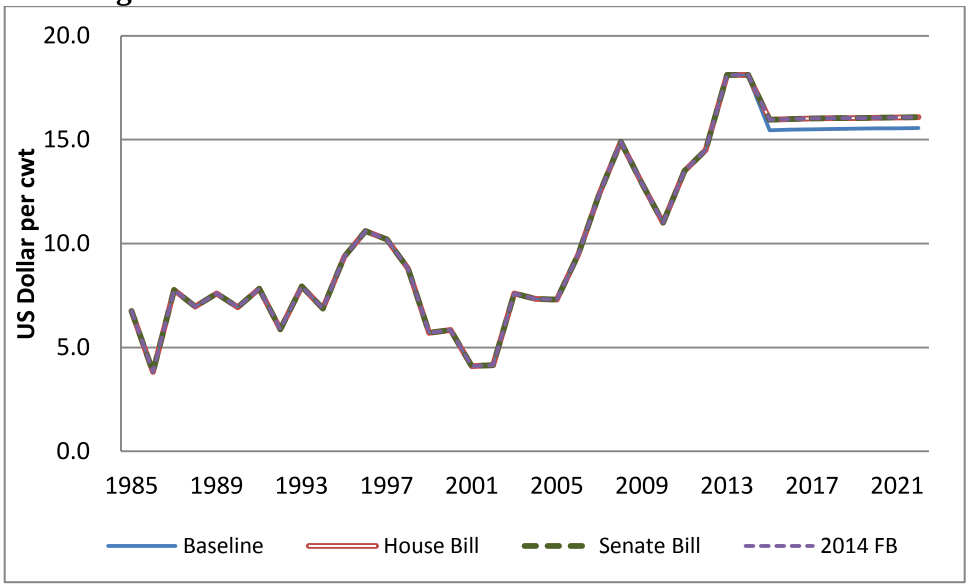


Figure B-237. Forecast Results for the U.S. LG Rice Total Planted Acres

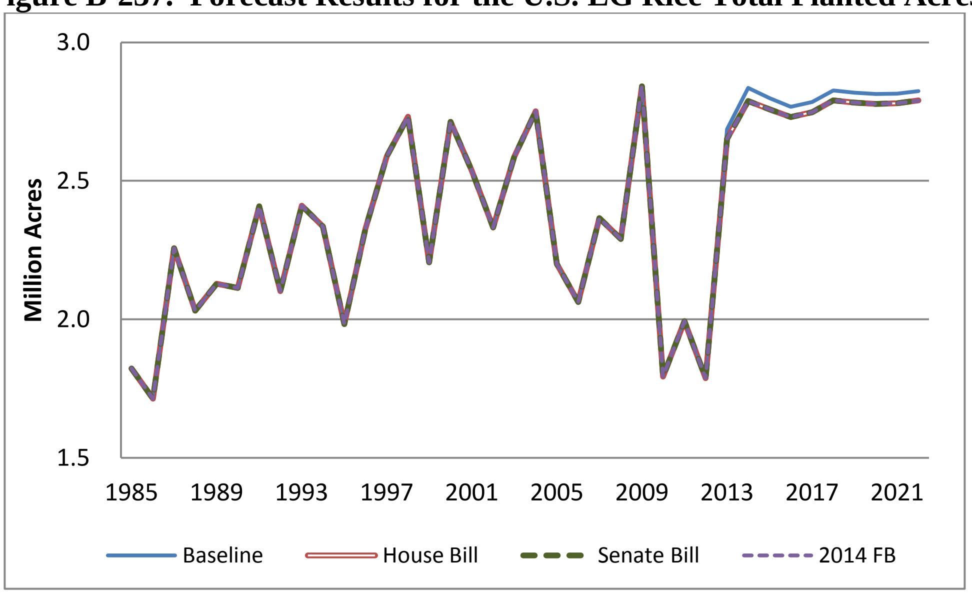


Figure B-238. Forecast Results for the U.S. LG Rice Total Production

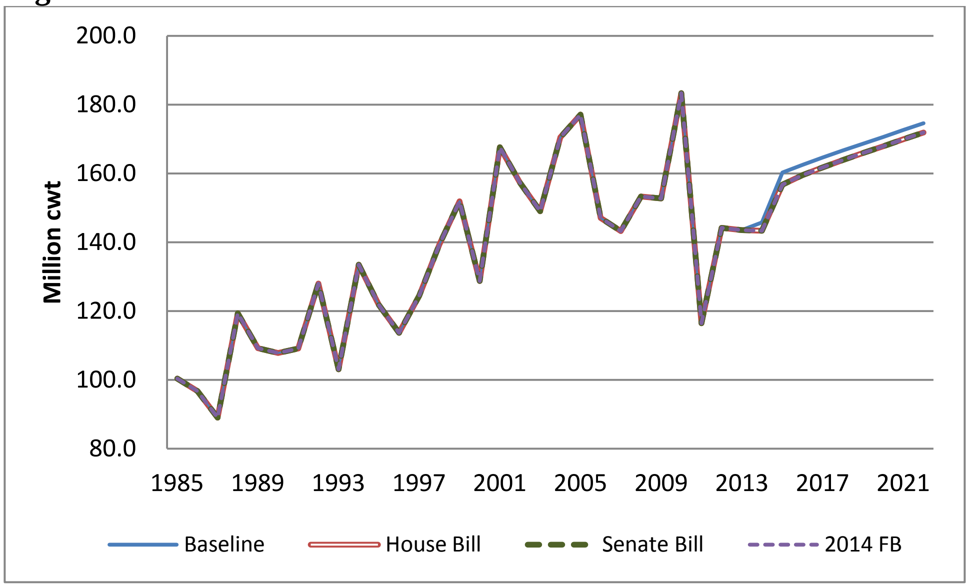
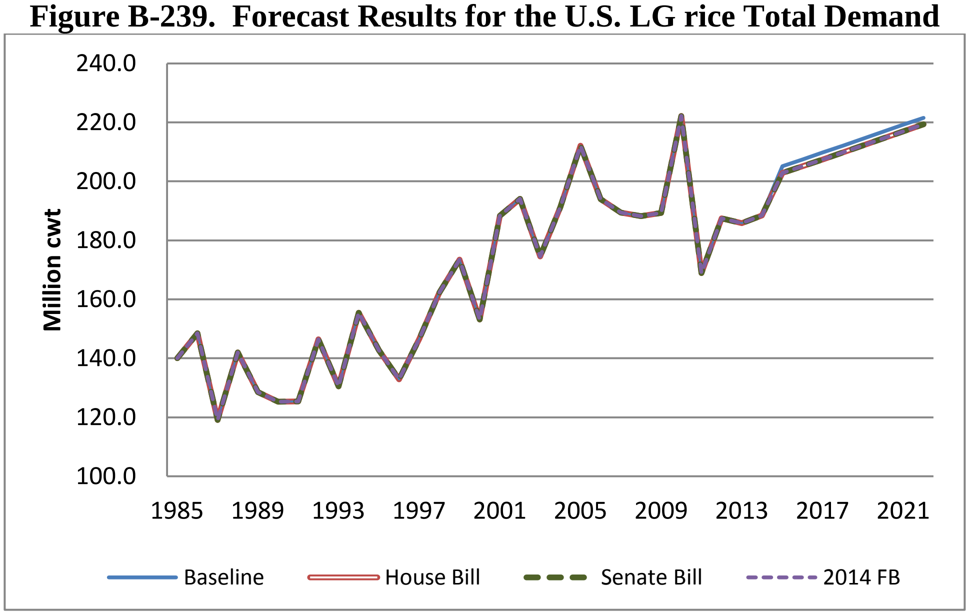


Figure B-239. Forecast Results for the U.S. LG rice Total Demand



Note: Total demand includes domestic and residual, export demand, and ending stocks.

Figure B-240. Forecast Results for Regional LG Rice ENRs

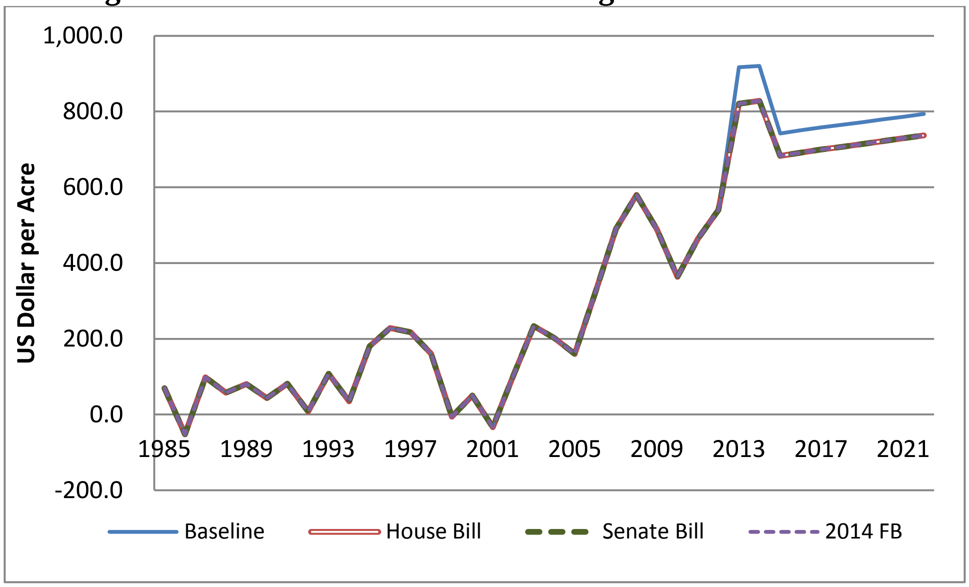


Figure B-241. Forecast Results for the U.S. MSG Rice Price

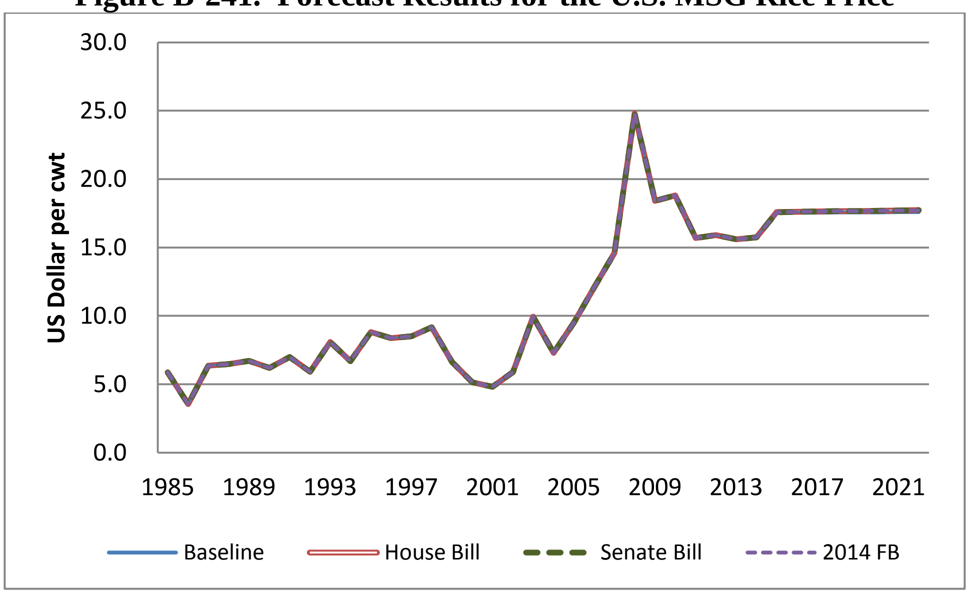


Figure B-242. Forecast Results for the U.S. MSG Rice Total Planted Acres

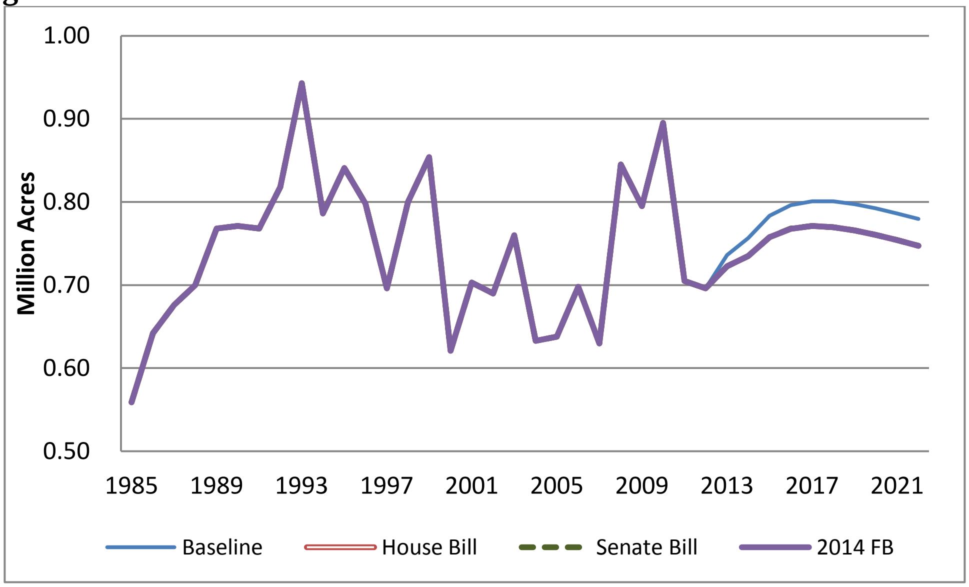


Figure B-243. Forecast Results for the U.S. MSG Rice Total Production

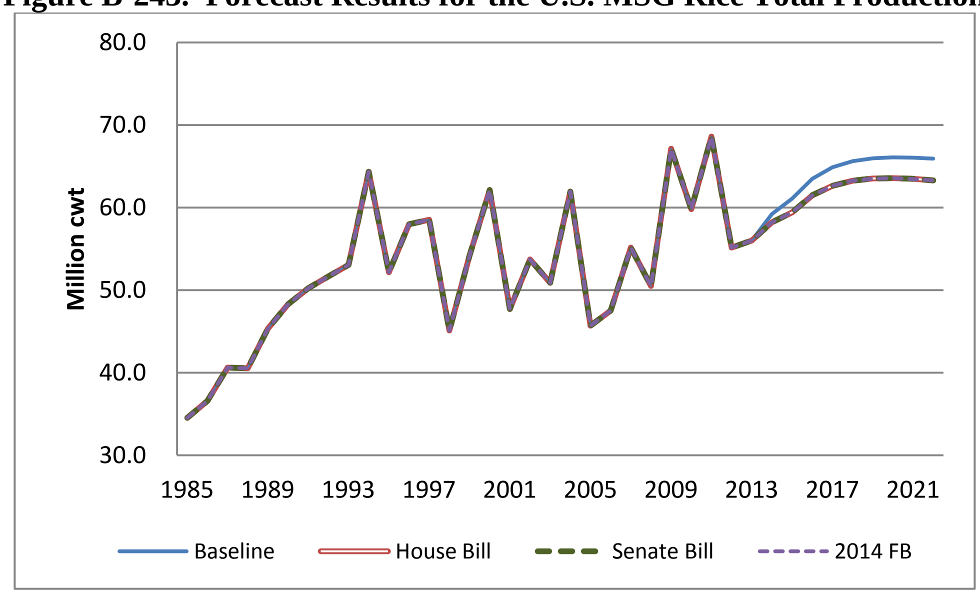
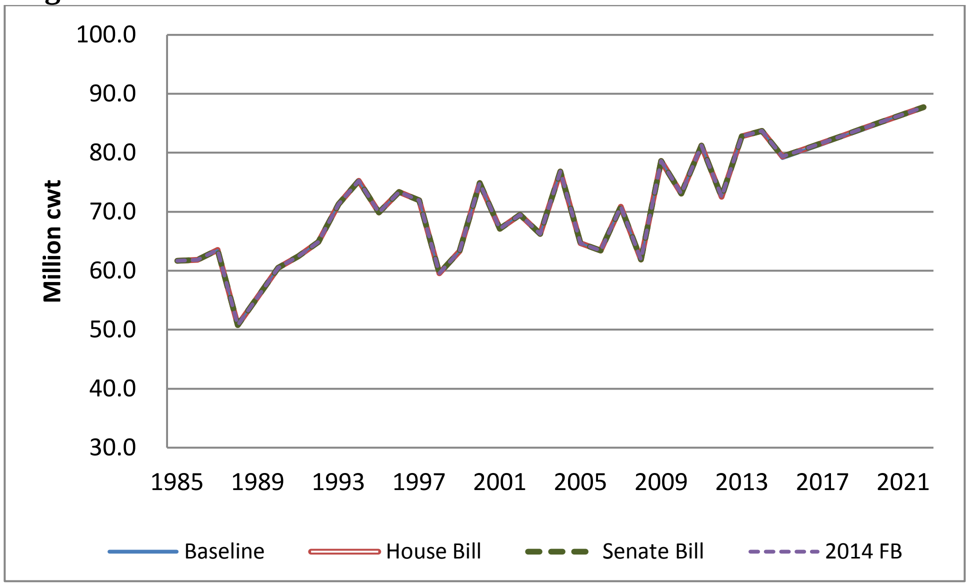


Figure B-244. Forecast Results for the U.S. MSG rice Total Demand



Note: Total demand includes domestic and residual, export demand, and ending stocks.

Figure B-245. Forecast Results for Regional MSG Rice ENRs

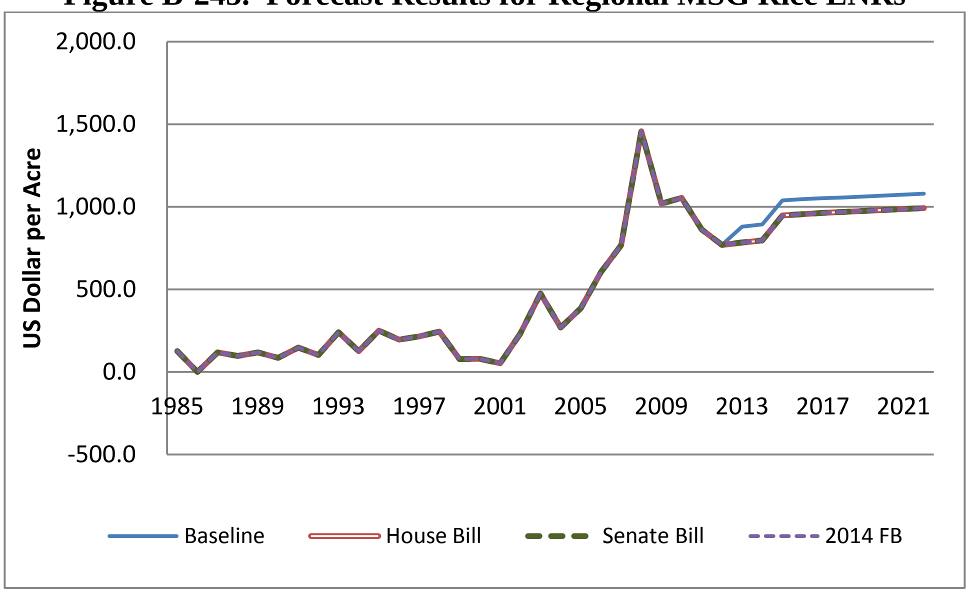


Figure B-246. Forecast Results for the U.S. Sorghum Price

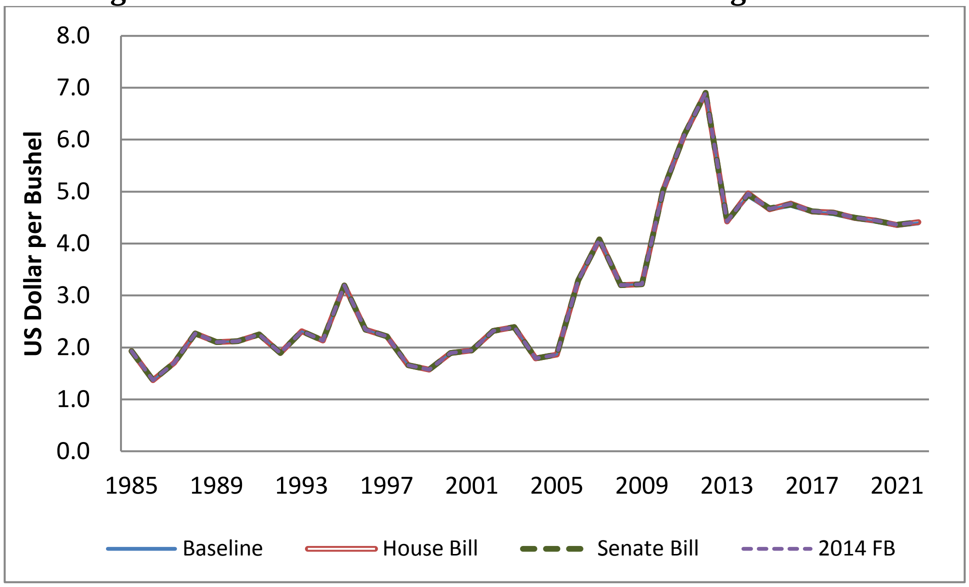


Figure B-247. Forecast Results for the U.S. Sorghum Total Planted Acres

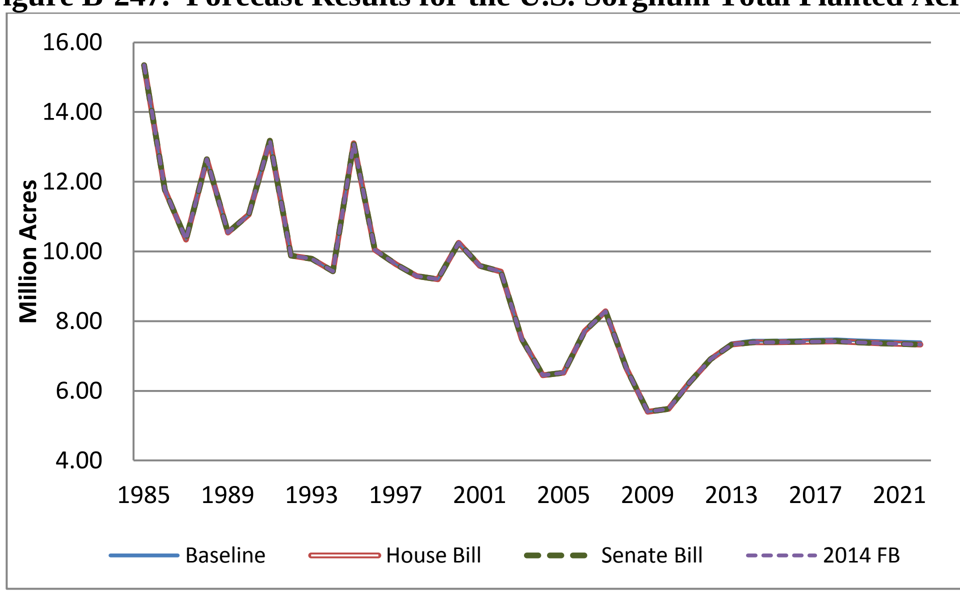


Figure B-248. Forecast Results for the U.S. Sorghum Total Production

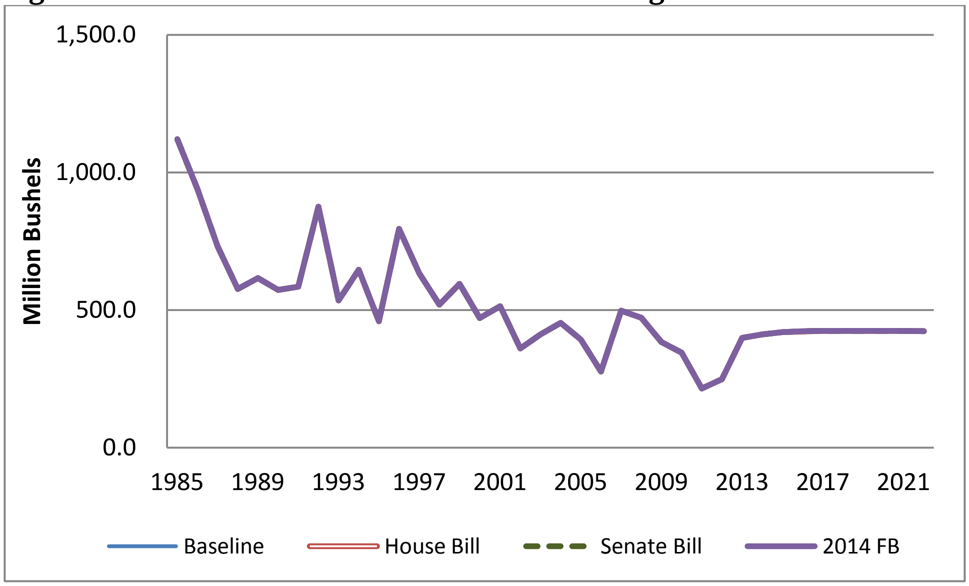
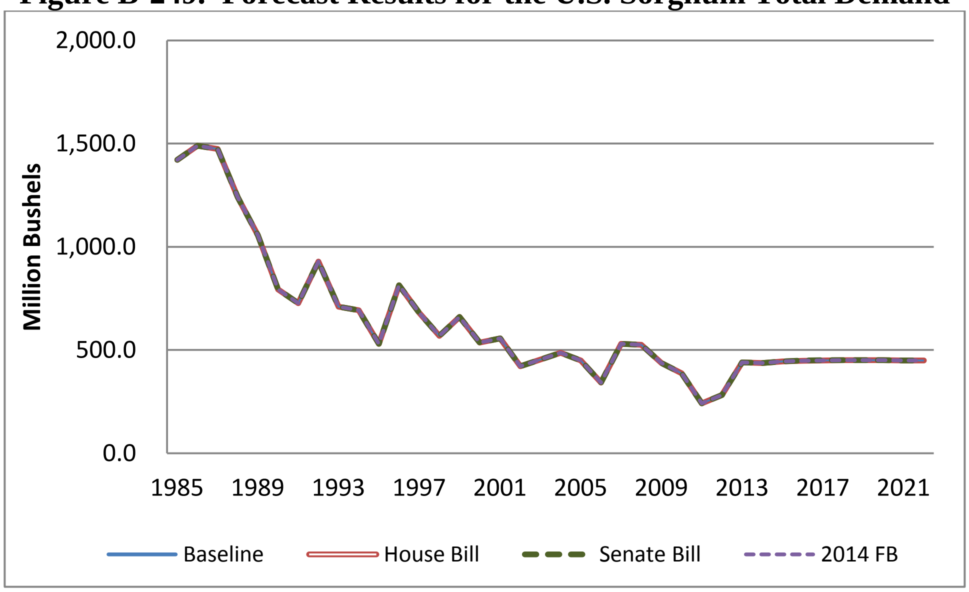


Figure B-249. Forecast Results for the U.S. Sorghum Total Demand



Note: Total demand includes seed, feed, food, export demand, and ending stocks.

Figure B-250. Forecast Results for Regional Sorghum ENRs

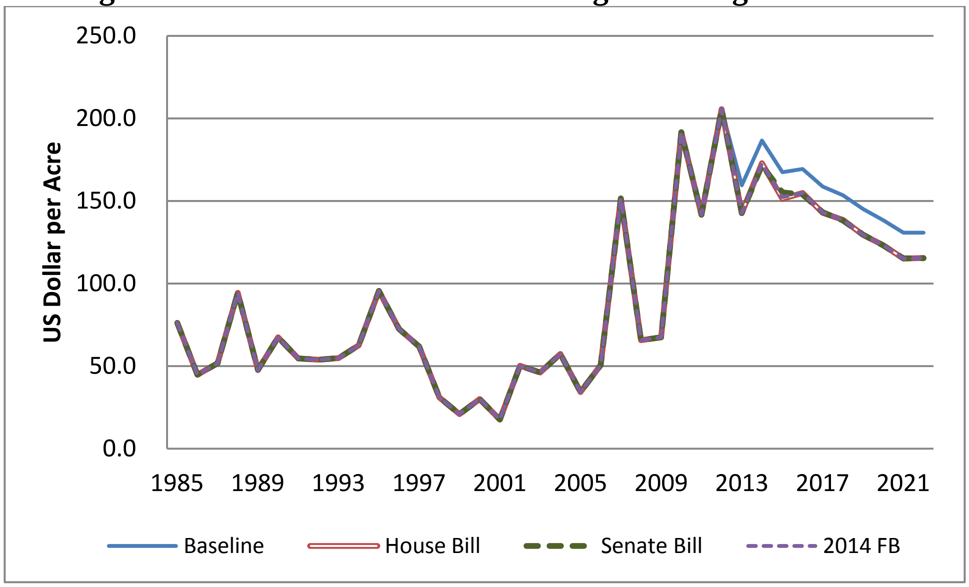


Figure B-251. Forecast Results for the U.S. Soybean Price

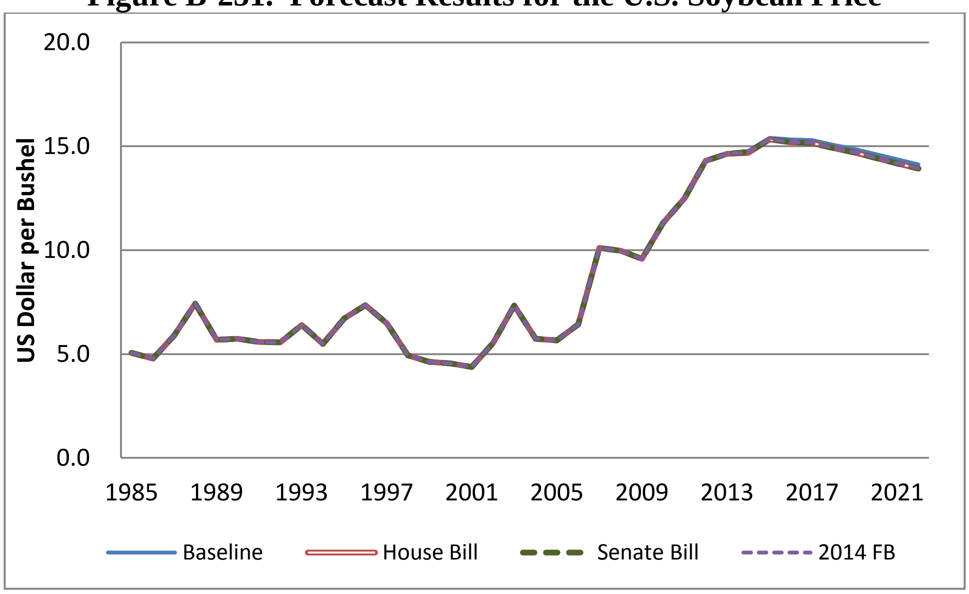


Figure B-252. Forecast Results for the U.S. Soybean Total Planted Acres

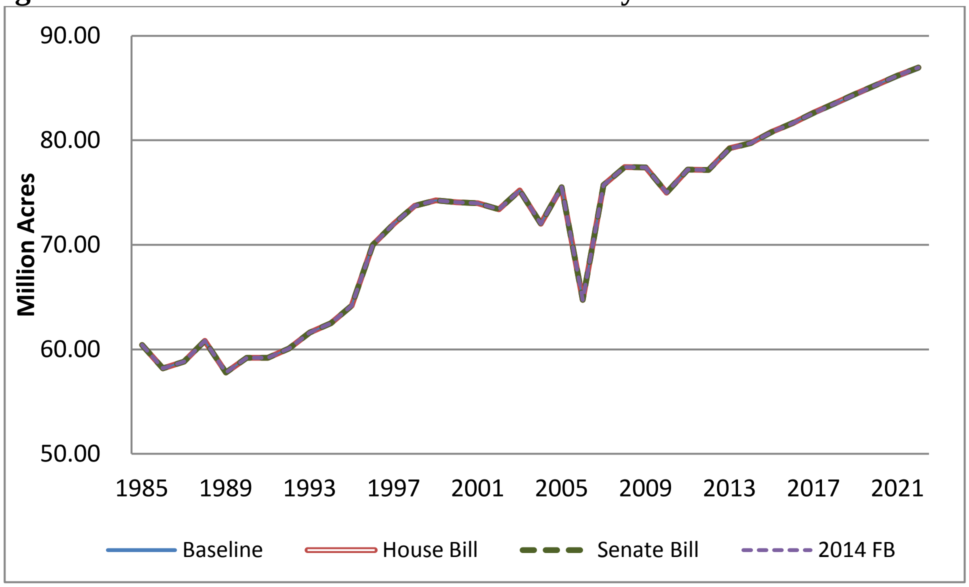


Figure B-253. Forecast Results for the U.S. Soybean Total Production

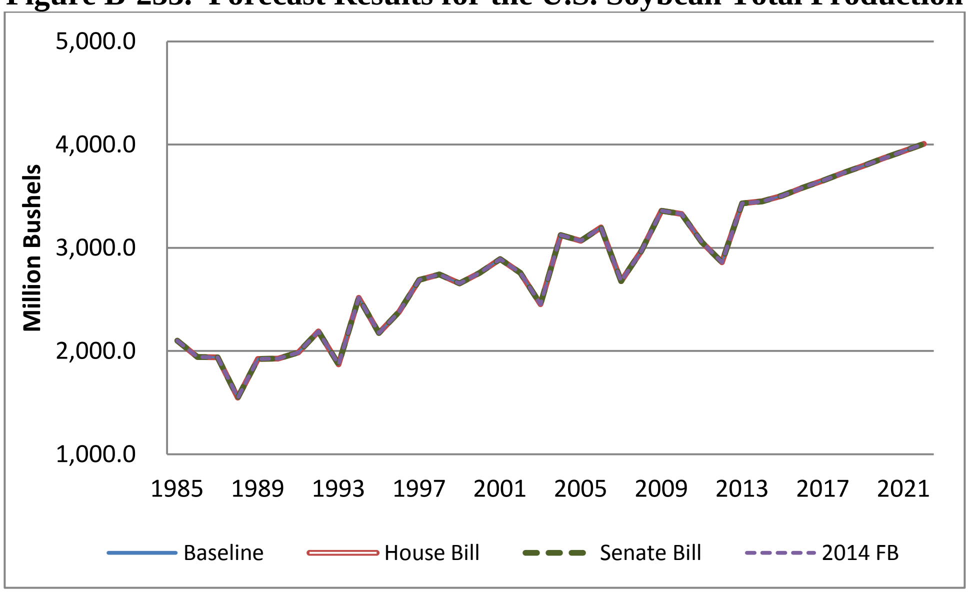
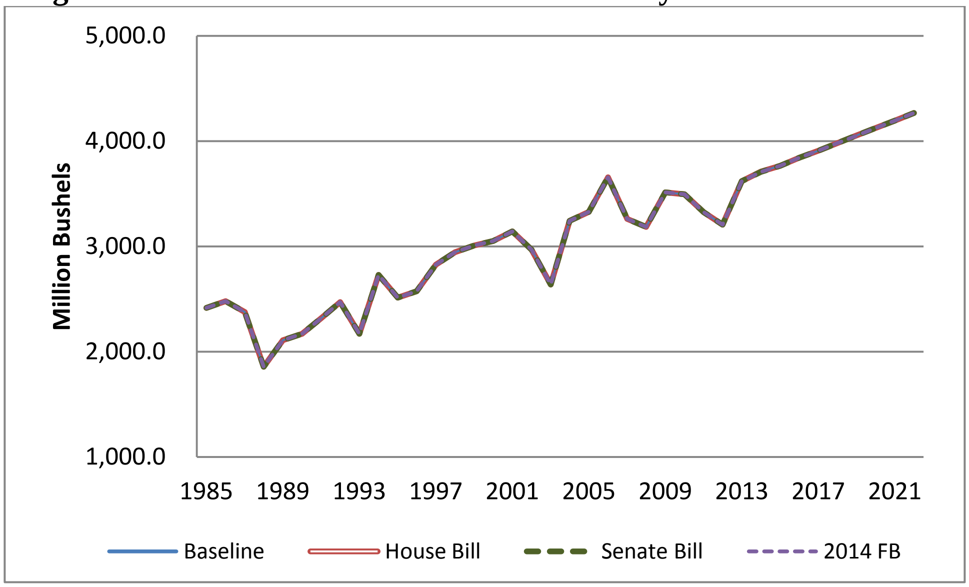


Figure B-254. Forecast Results for the U.S. Soybean Total Demand



Note: Total demand includes seed, feed, and residual, crushing, export demand, and ending stocks.

Figure B-255. Forecast Results for the U.S. Soybean Crushing Margins

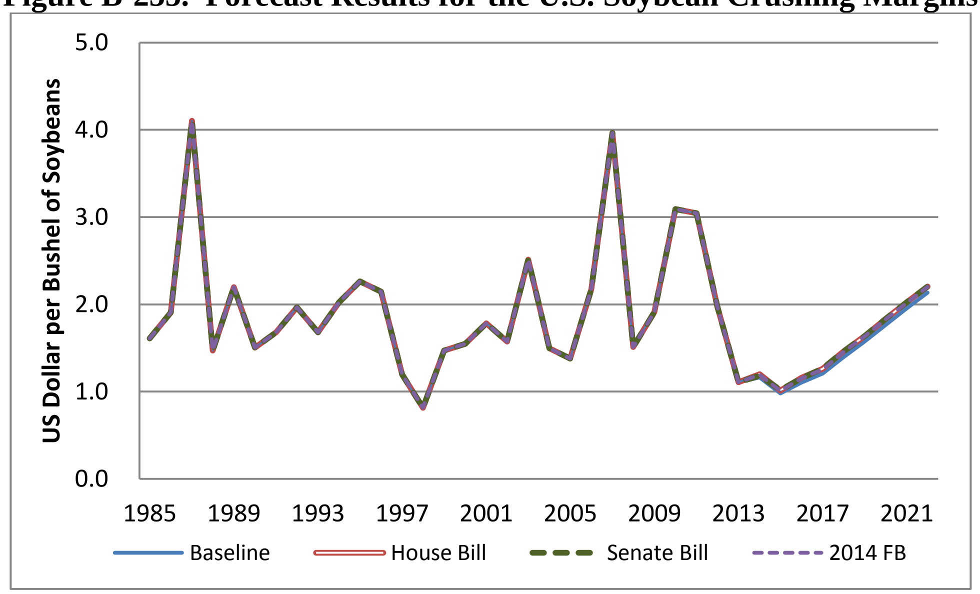


Figure B-256. Forecast Results for Regional Soybeans ENRs

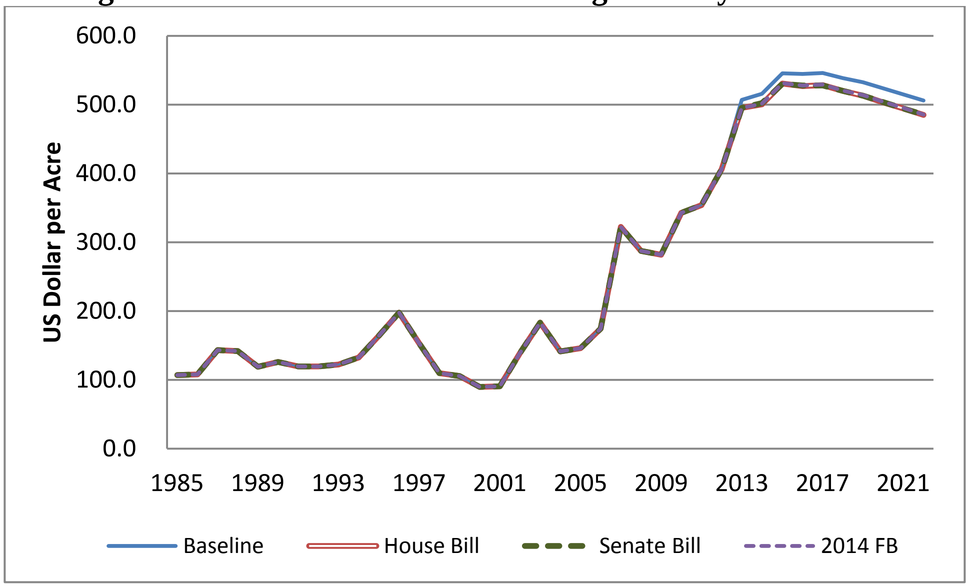


Figure B-257. Forecast Results for the U.S. Soybean Meal Price

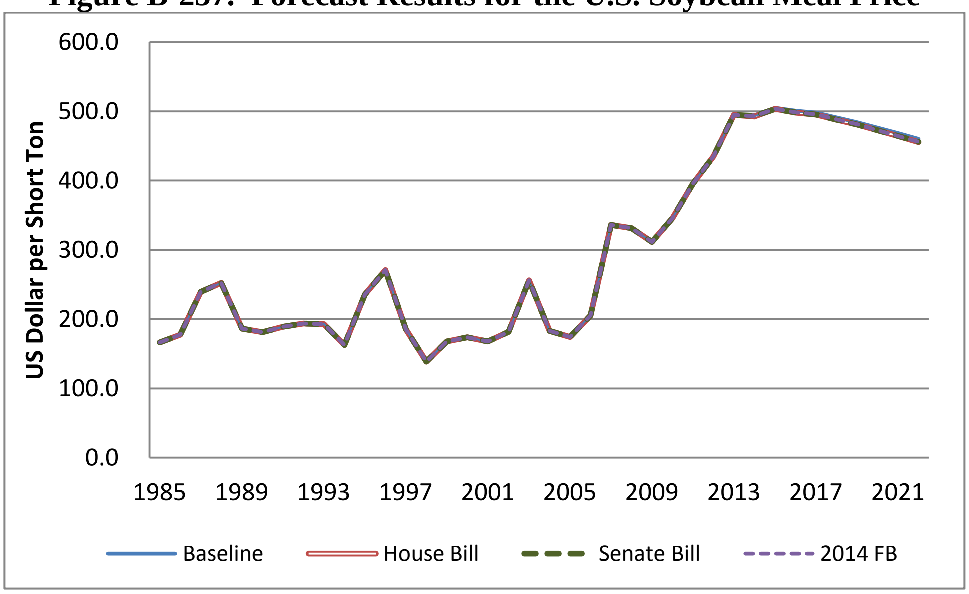


Figure B-258. Forecast Results for the U.S. Soybean Meal Total Production

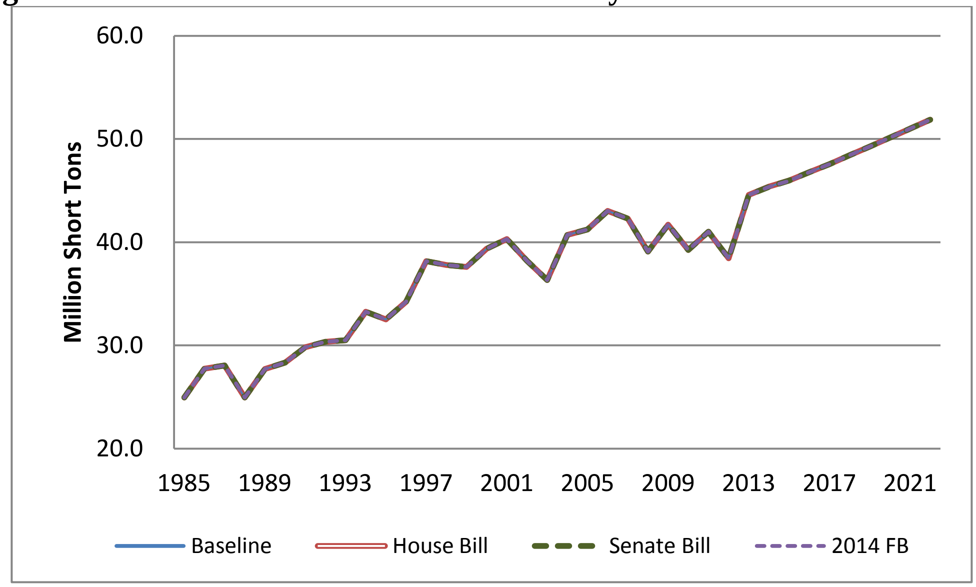
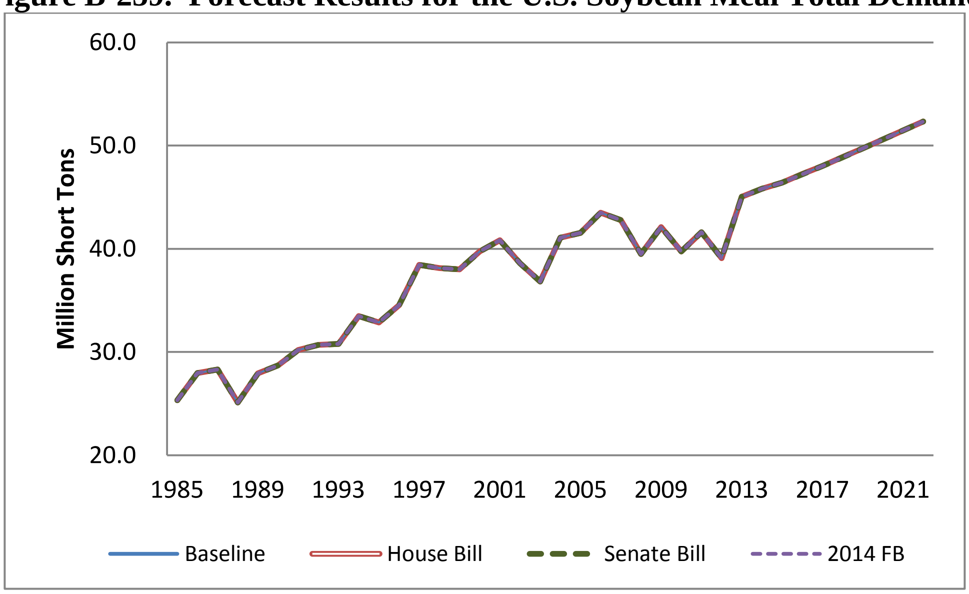


Figure B-259. Forecast Results for the U.S. Soybean Meal Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-260. Forecast Results for the U.S. Soybean Oil Price

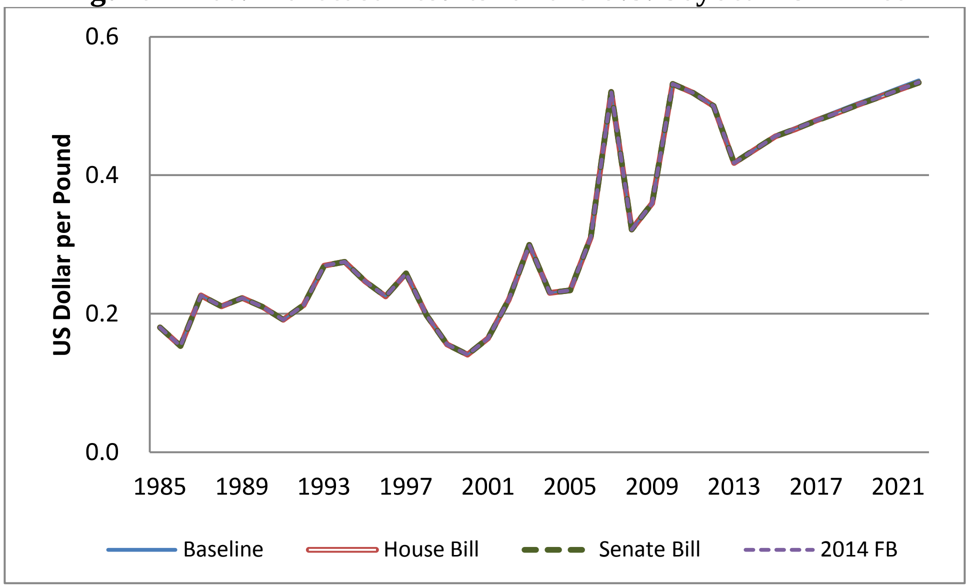


Figure B-261. Forecast Results for the U.S. Soybean Oil Total Production

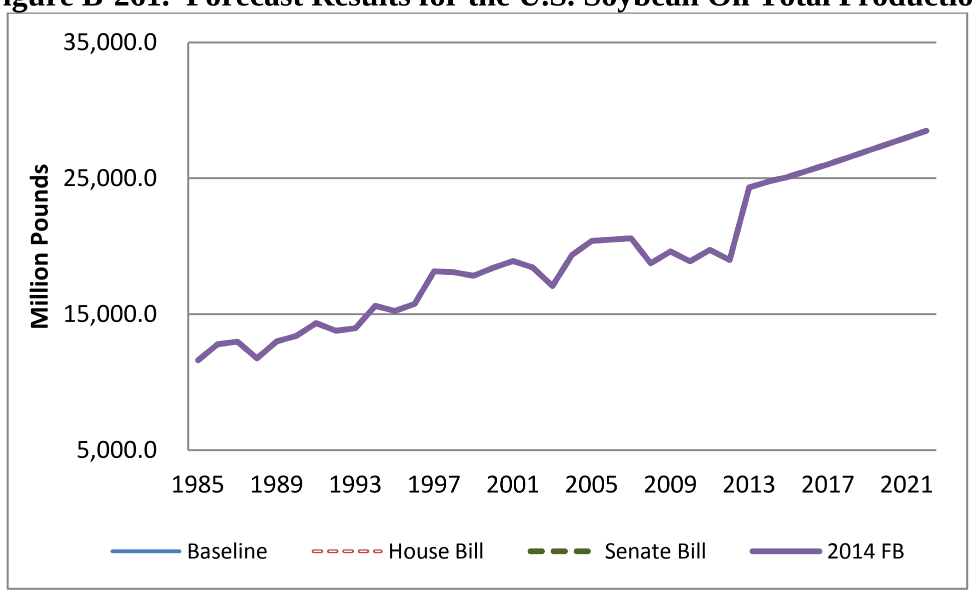
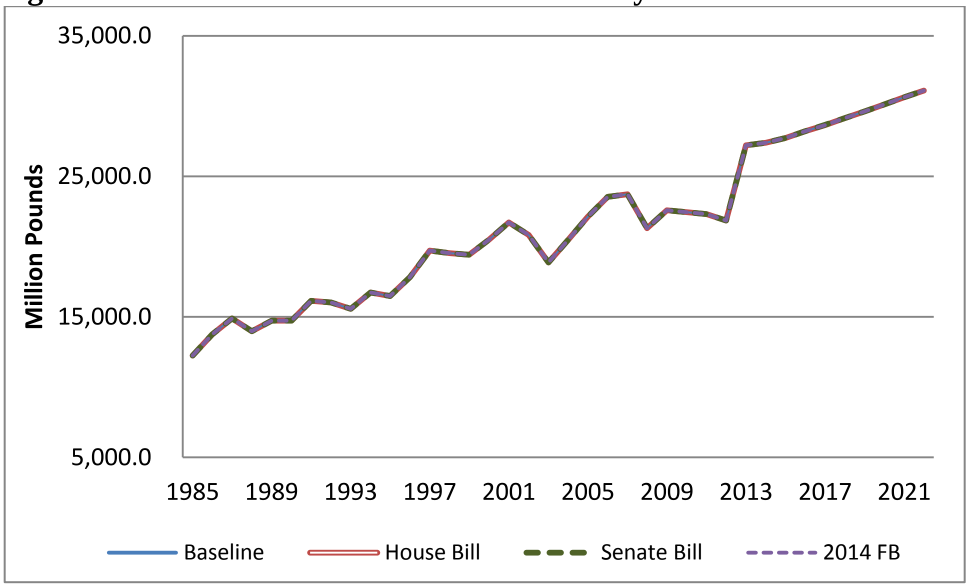


Figure B-262. Forecast Results for the U.S. Soybean Oil Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-263. Forecast Results for the U.S. Wheat Price

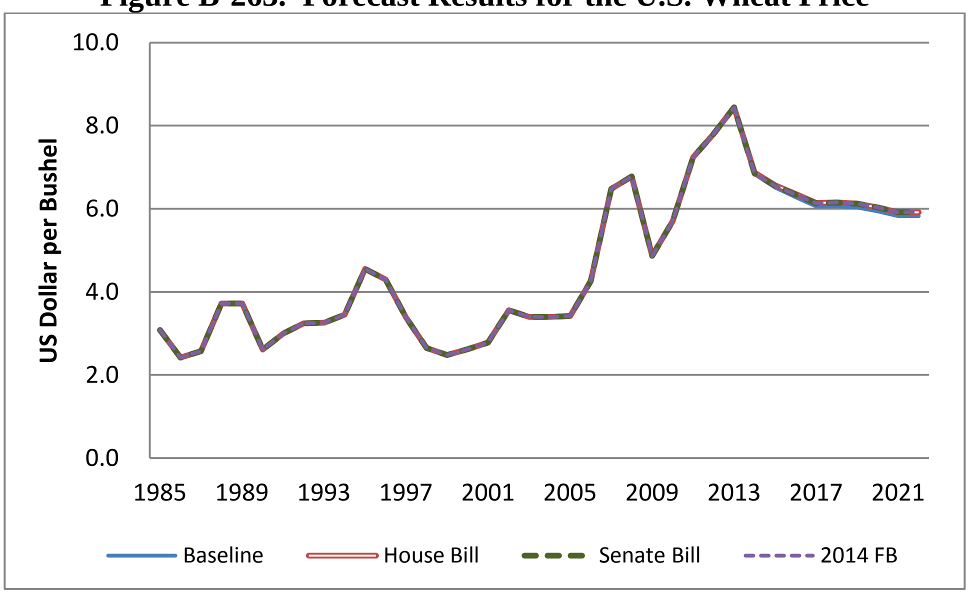


Figure B-264. Forecast Results for the U.S. Wheat Total Planted Acres

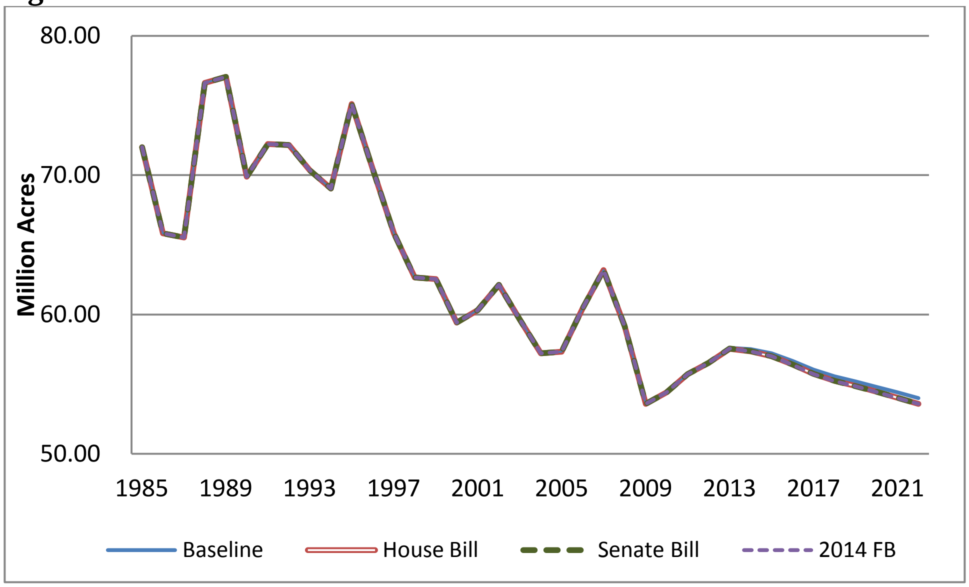


Figure B-265. Forecast Results for the U.S. Wheat Total Production

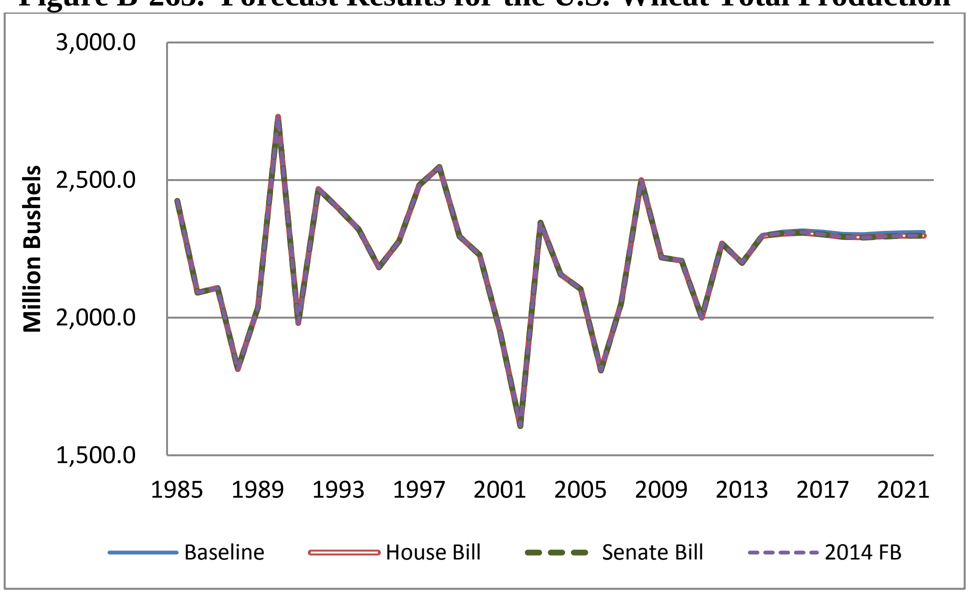
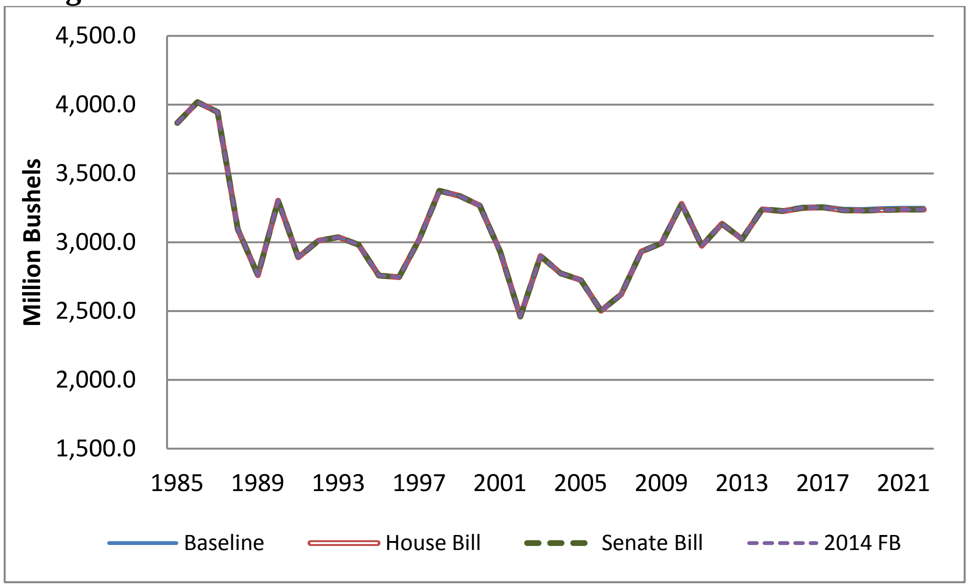


Figure B-266. Forecast Results for the U.S. Wheat Total Demand



Note: Total demand includes seed, feed and residual, food, export demand.

Figure B-267. Forecast Results for Regional Wheat ENRs

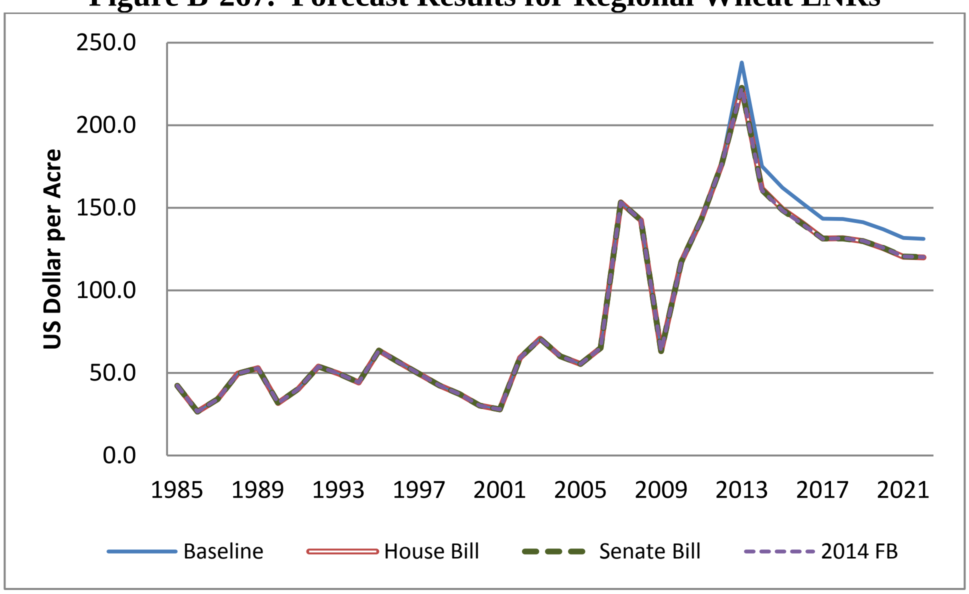


Figure B-268. Forecast Results for the U.S. Peanut Price

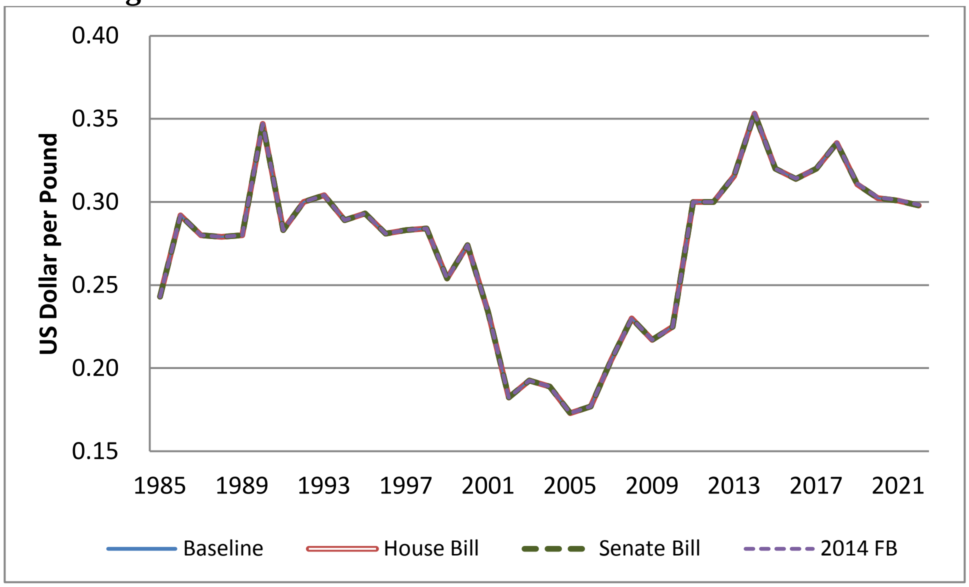


Figure B-269. Forecast Results for the U.S. Peanut Total Planted Acres

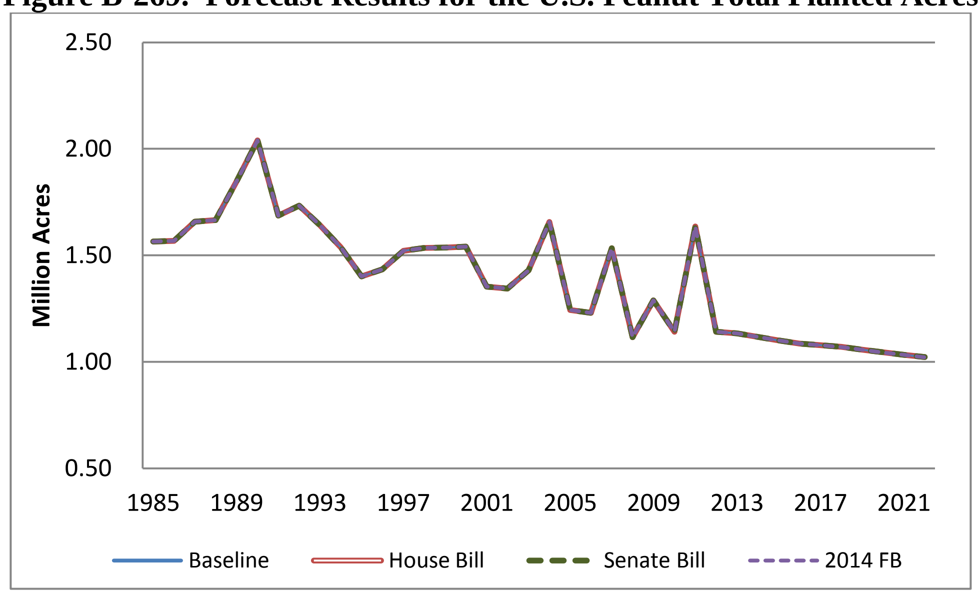


Figure B-270. Forecast Results for the U.S. Peanut Total Production

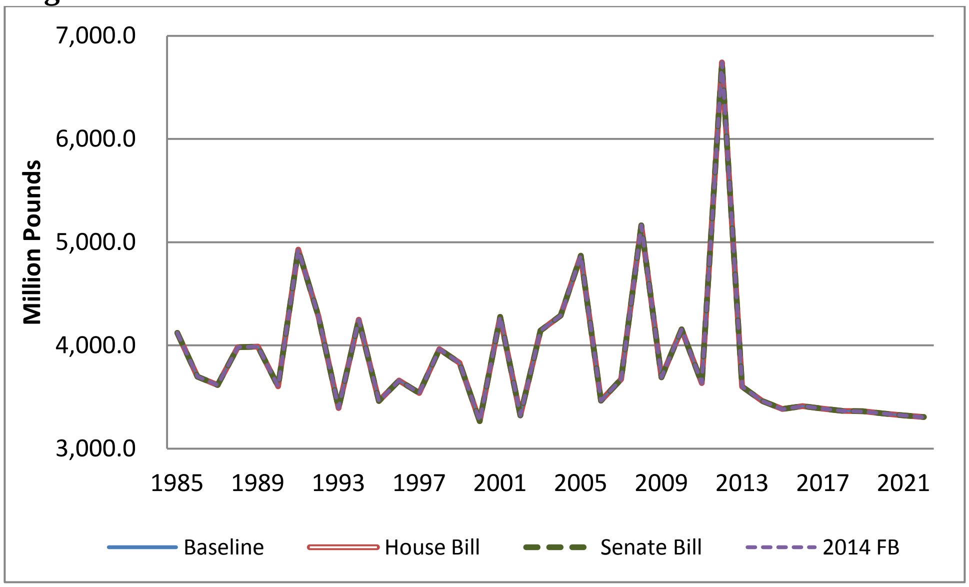
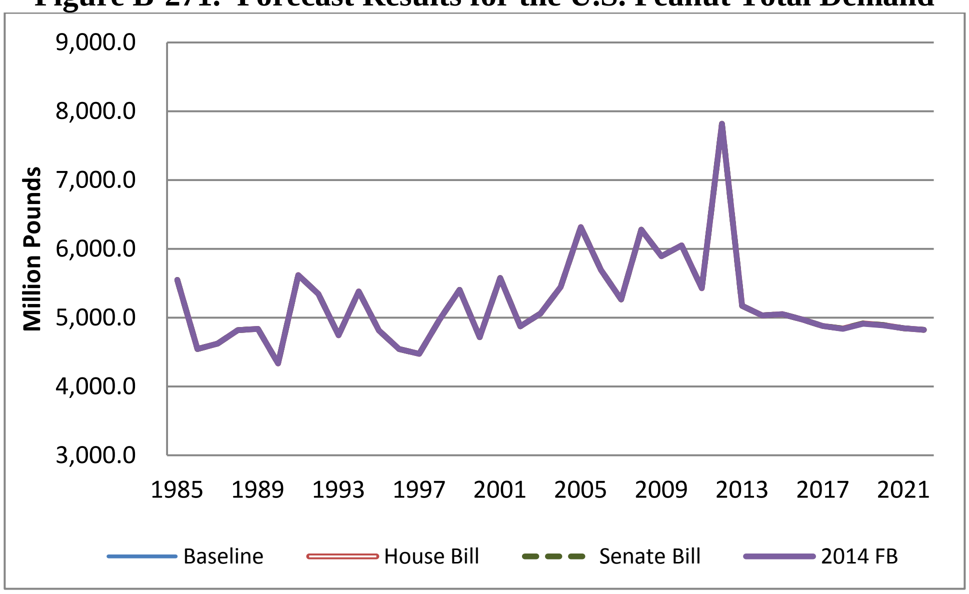


Figure B-271. Forecast Results for the U.S. Peanut Total Demand



Note: Total demand includes seed, loss, shrinkage, and residual, crushing, export demand, and ending stocks.

Figure B-272. Forecast Results for Regional Peanut ENRs

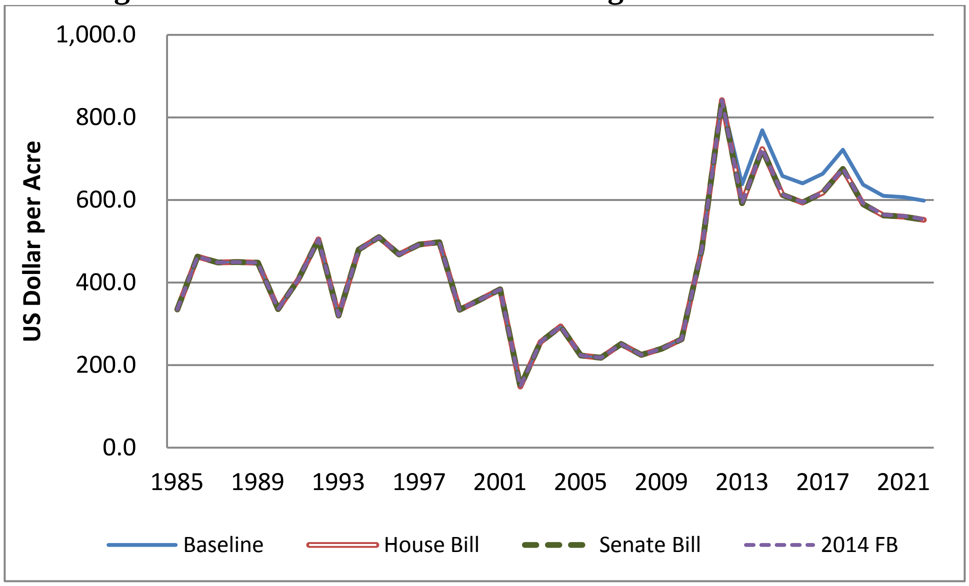


Figure B-273. Forecast Results for the U.S. Ethanol Price

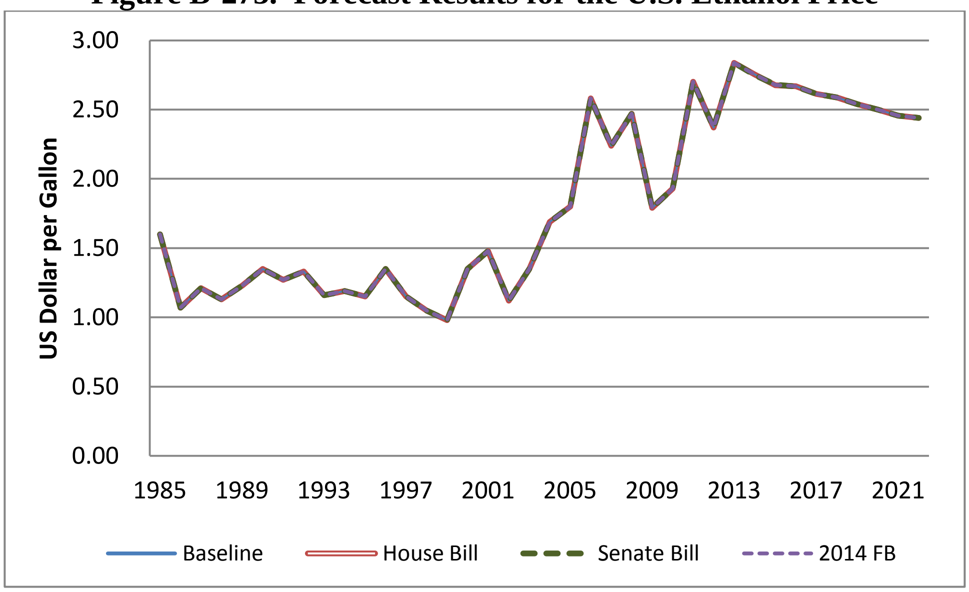


Figure B-274. Forecast Results for the U.S. Ethanol Total Production

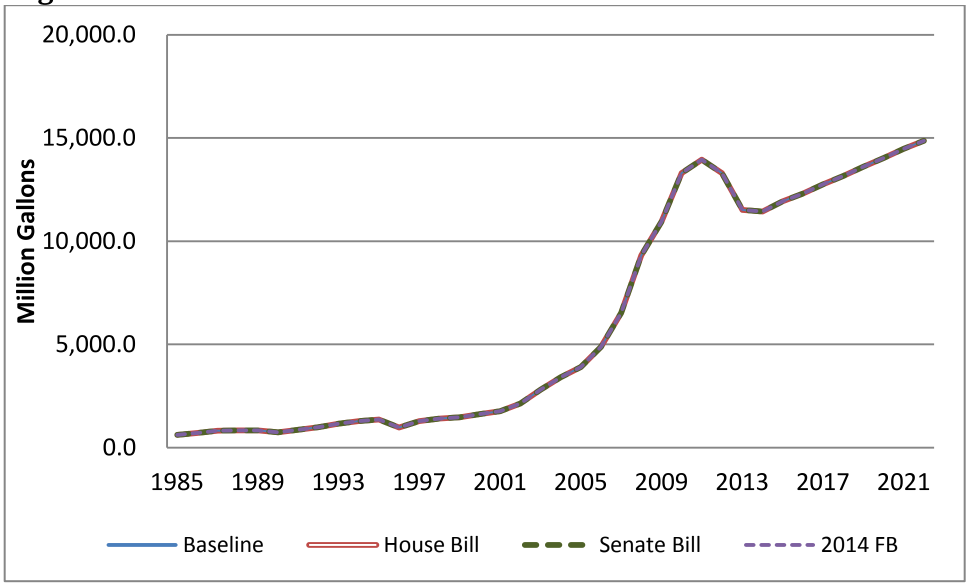
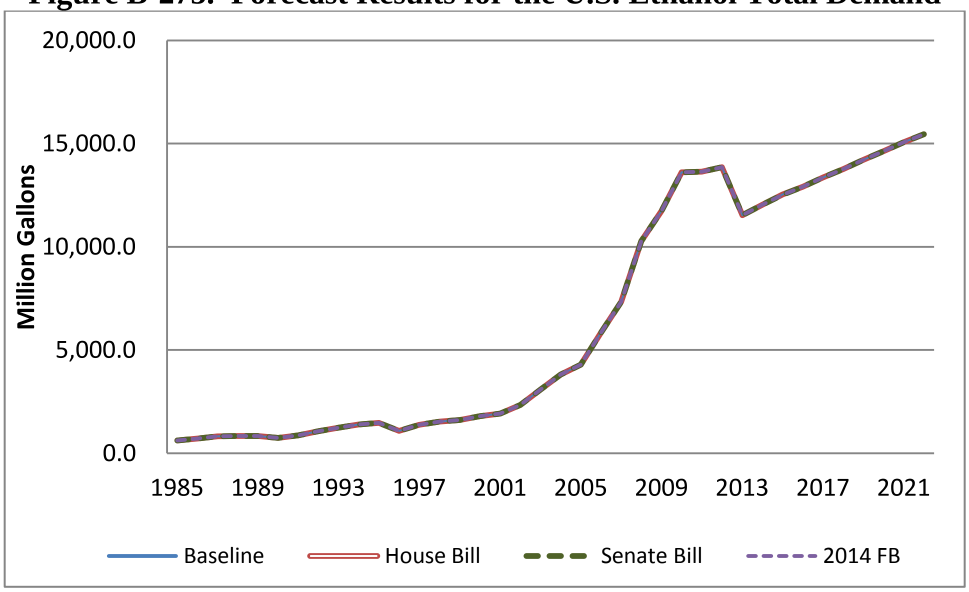


Figure B-275. Forecast Results for the U.S. Ethanol Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

Figure B-276. Forecast Results for the U.S. Biodiesel Price

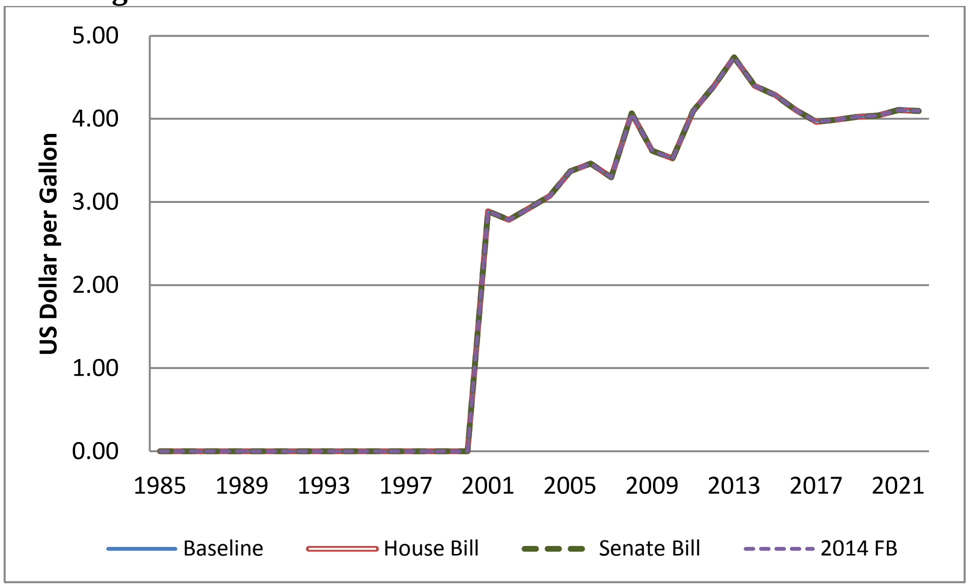


Figure B-277. Forecast Results for the U.S. Biodiesel Total Production

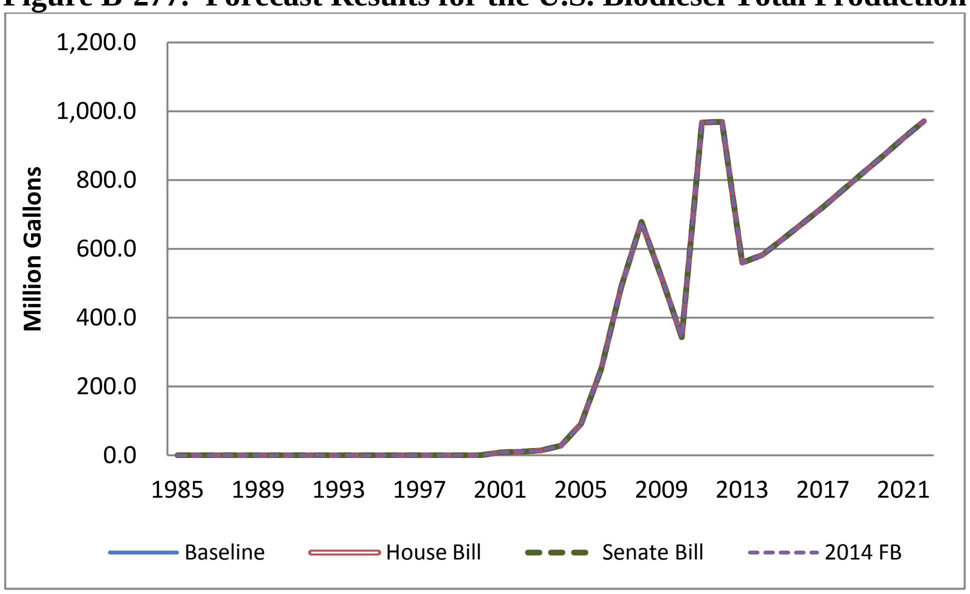
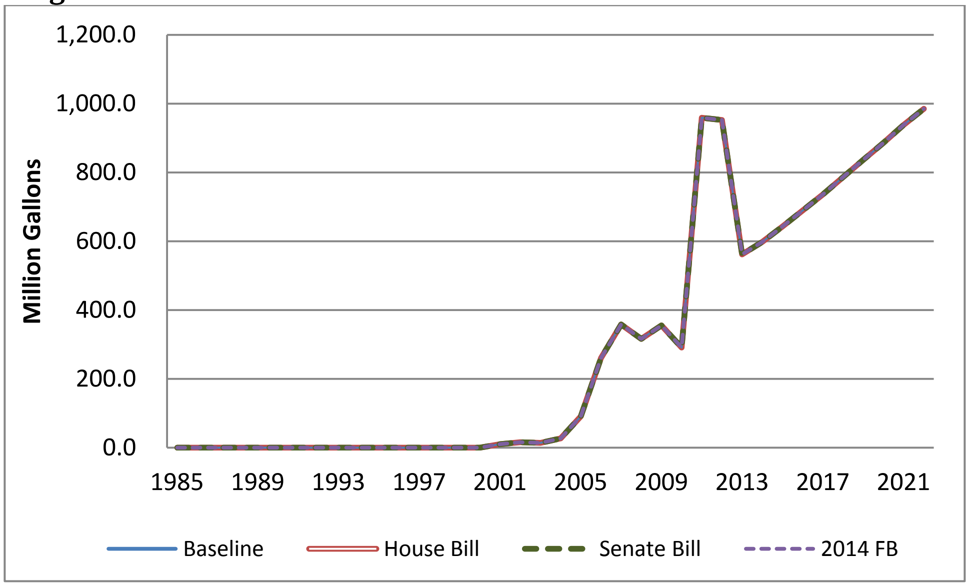


Figure B-278. Forecast Results for the U.S. Biodiesel Total Demand



Note: Total demand includes domestic, export demand, and ending stocks.

APPENDIX C

TABLES

Table C-1. Regional Division Definition

Region	States Included
Corn Belt (CB)	Iowa, Illinois, Indiana, Missouri, and Ohio
Central Plains (CP)	Colorado, Kansas, and Nebraska
Delta States (DS)	Arkansas, Louisiana, and Mississippi
Far West (FW)	Alaska, California, Hawaii, Idaho, Nevada, Oregon, Utah, Washington, and Arizona
Lake States (LS)	includes Michigan, Minnesota, and Wisconsin
North East (NE)	Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia
Northern Plains (NP)	Montana, North Dakota, South Dakota, and Wyoming
South East (SE)	Alabama, Florida, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, and Virginia
Southern Plains (SP)	New Mexico, Oklahoma and Texas

Table C-2. Regional Division and Major Program Commodity Mix

Region	CB	CP	DS	FW	LS	NE	NP	SE	SP
Barley		O		X	O	O	X	O	
Corn	X	X	X	X	X	X	X	X	X
Cotton	O	O	X	X				X	X
Oats	O	O		X	X	O	X	O	X
Long Grain Rice	O		X						O
Medium/ Short Grain Rice	O		X	X					O
Sorghum	O	X	O	O			O	O	X
Soybean	X	X	X		X	X	X	X	O
Wheat	X	X	X	X	X		X	X	X
Peanuts								X	O

Note: 1) The symbol 'X' and 'O' represent the major and 'other' production regions.
2) CB is Corn Belt; CP is Central Plains; Delta States; FW is Far West; LS is Lake States; NE is North East; NP is Northern Plains; SE is South East; and SP is Southern Plains.

Table C-3. Estimation Results for Corn Planted Acres, Harvested Acres, and Expected Yields in the Corn Belt

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRCBPA _LEAD1	0.809	Intercept	-323.668***	0.000
		YEAR	0.181***	0.000
		CRSBCB	-3.010**	0.018
		D1106	2.748***	0.007
		D9391	3.523***	0.001
		D0102	-1.628*	0.065
CRCBHA	0.986	Intercept	-1.139	0.191
		CRCBPA	1.002***	0.000
CRCBYLE	0.836	Intercept	-3507.507***	0.000
		YEAR	1.827***	0.000
		D12	-55.216***	0.000
		CRCBYLD1	-28.641***	0.000
		D9492	13.594*	0.059

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-4. Estimation Results for Corn Planted Acres, Harvested Acres, and Expected Yields in the Central Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRCPPA _LEAD1	0.944	Intercept	-464.660***	0.000
		YEAR	0.239***	0.000
		CRSBCP	-0.896	0.109
		D0502	-1.386***	0.001
		D9697	1.004**	0.013
		D10	0.931*	0.088
CRCPHA	0.965	Intercept	1.645	0.698
		CRCPPA	0.924***	0.000
CRCPYLE	0.871	Intercept	-1757.159***	0.000
		YEAR	0.950***	0.000
		D9593	-25.679***	0.000
		D1209	16.167***	0.001
		D0200	-16.355***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-5. Estimation Results for Corn Planted Acres, Harvested Acres, and Expected Yields in the Delta States

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRDSPA _LEAD1	0.887	Intercept	-113.600***	0.000
		YEAR	0.057***	0.000
		CRSBDS	-0.119*	0.062
		D0405	-0.589***	0.001
		D12	0.741***	0.003
		D06	0.690***	0.004
CRDSHA	0.995	Intercept	-0.050***	0.004
		CRDSPA	0.985***	0.000
CRDSYLE	0.838	Intercept	-4129.433***	0.000
		YEAR	2.125***	0.000
		D98	-29.230***	0.005
		D07	23.868**	0.022
		D12	21.734**	0.041

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-6. Estimation Results for Corn Planted Acres, Harvested Acres, and Expected Yields in the Far West

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRFWPA _LEAD1	0.905	Intercept	-58.608***	0.000
		YEAR	0.030***	0.000
		CRBAFW	-0.066	0.664
		D85	0.342***	0.000
		D00	-0.126*	0.098
		D86	0.163**	0.050
CRFWHA	0.774	Intercept	0.180***	0.000
		CRFWPA	0.237***	0.000
		D8586	0.127***	0.000
		D0106	-0.093***	0.000
CRFWYLE	0.962	Intercept	-2622.431***	0.000
		YEAR	1.397***	0.000
		D12	-79.737***	0.000
		D0711	7.255***	0.004

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-7. Estimation Results for Corn Planted Acres, Harvested Acres, and Expected Yields in the Lake States

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRLSPA_LEAD1	0.764	Intercept	-90.363**	0.013
		YEAR	0.052***	0.005
		CRSBLS	-0.833**	0.011
		D91	0.901	0.102
		D12	1.422**	0.014
		D06	1.259**	0.023
CRLSHA	0.976	Intercept	-1.021*	0.069
		CRLSPA	0.953***	0.000
		D93	-1.505***	0.000
		D88	-1.445***	0.000
CRLSYLE	0.866	Intercept	-3566.245***	0.000
		YEAR	1.852***	0.000
		D88	-43.467***	0.000
		D93	-39.440***	0.000
		D05	15.773*	0.083

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-8. Estimation Results for Corn Planted Acres, Harvested Acres, and Expected Yields in the North East

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRNEPA_LEAD1	0.736	Intercept	34.028***	0.000
		YEAR	-0.015***	0.000
		CRSBNE	-0.063	0.277
		D85	0.546***	0.000
		D12	0.391***	0.003
		D96	0.233**	0.049
CRNEHA	0.877	Intercept	-0.166	0.403
		CRNEPA	0.681***	0.000
		D99	-0.277***	0.002
		D0203	-0.182***	0.005
CRNEYLE	0.781	Intercept	-2409.396***	0.000
		YEAR	1.262***	0.000
		D0299	-35.032***	0.000
		D88	-29.256***	0.004
		D0400	16.716**	0.015

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-9. Estimation Results for Corn Planted Acres, Harvested Acres, and Expected Yields in the Northern Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRNPPA _LEAD1	0.888	Intercept	-283.546***	0.000
		YEAR	0.145***	0.000
		CRSBNP	-0.011	0.540
		D12	2.439***	0.000
		D94	-1.344**	0.017
CRNPHA	0.955	Intercept	-0.921***	0.001
		CRNPPA	1.005***	0.000
CRNPYLE	0.859	Intercept	-4366.045***	0.000
		YEAR	2.236***	0.000
		D12	-33.115***	0.001
		CRNPYLD1	-23.009***	0.000
		D9894	14.901**	0.025

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-10. Estimation Results for Corn Planted Acres, Harvested Acres, and Expected Yields in the South East

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRSEPA _LEAD1	0.815	Intercept	99.284***	0.000
		YEAR	-0.047***	0.000
		CRSBSE	-0.237	0.171
		D85	1.723***	0.000
		CRSEPAD1	1.038***	0.000
		D9902	-0.544***	0.003
CRSEHA	0.958	Intercept	0.144	0.380
		CRSEPA	0.829***	0.000
CRSEYLE	0.720	Intercept	-2442.789***	0.000
		YEAR	1.274***	0.000
		D9192	-24.639**	0.032
		CRSEYLD1	22.393***	0.002
		CRSEYLD2	-17.045**	0.015

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-11. Estimation Results for Corn Planted Acres, Harvested Acres, and Expected Yields in the Southern Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRSPPA_LEAD1	0.783	Intercept	-75.805***	0.000
		YEAR	0.039***	0.000
		CRSOSP	-0.563*	0.058
		D97	0.493***	0.019
		D0200	-0.389***	0.011
		D05	-0.509	0.107
CRSPHA	0.842	Intercept	0.289**	0.047
		CRSPPA	0.727***	0.000
CRSPYLE	0.761	Intercept	-1588.865***	0.000
		YEAR	0.852***	0.000
		D11	-33.190***	0.000
		CRSPYLD1	19.328***	0.000
		D1007	20.218***	0.001

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-12. Estimation Results for the U.S. Corn Seed Use

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRUSSE	0.998	Intercept	0.710***	0.001
		CRUSPA_LEAD1	0.245***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-13. Estimation Results for the U.S. Corn Feed Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRUSFE	0.852	Intercept	-1491.246	0.346
		CRUSRFP	-463.585***	0.000
		SMUSRFP	295.758	0.790
		CRUSPR	0.041	0.319
		GCAU	1491.225***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-14. Estimation Results for the U.S. Corn Food and Industrial Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRUSFI	0.891	Intercept	-38977.516***	0.000
		YEAR	20.194***	0.000
		CRUSRFP	-40.854***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-15. Estimation Results for the U.S. Corn Export Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CREX	0.707	Intercept	4405.874***	0.000
		CRUSRFP	-958.799***	0.001
		WHUSRFP	278.799***	0.002
		SOUSRFP	497.174**	0.020
		USREER	-21.957**	0.012
		D12	-715.252**	0.017
		D1007	324.153*	0.063
		CREXD1	-468.991***	0.001

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-16. Estimation Results for Regional Corn Price

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CRCBFP	0.999	Intercept CRUSFP	-0.095*** 1.042***	0.000 0.000
CRCPFP	0.998	Intercept CRUSFP	0.014 0.994***	0.568 0.000
CRDSFP	0.962	Intercept CRUSFP	0.282** 0.939***	0.020 0.000
CRFWFP	0.992	Intercept CRUSFP	0.824*** 0.904***	0.000 0.000
CRLSFP	0.997	Intercept CRUSFP	-0.091*** 0.999***	0.007 0.000
CRNEFP	0.990	Intercept CRUSFP	0.059 1.130***	0.403 0.000
CRNPFP	0.989	Intercept CRUSFP	-0.370*** 1.073***	0.000 0.000
CRSEFP	0.988	Intercept CRUSFP	0.116 1.043***	0.112 0.000
CRSPFP	0.974	Intercept CRUSFP	0.491*** 0.914***	0.000 0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-17. Estimation Results for Barley Planted Acres, Harvested Acres, and Expected Yields in the Far West

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
BAFWPA_LEAD1	0.963	Intercept BAFWPA BAWHFW D86 D95 D08	0.204 0.840*** -0.012 -0.494*** 0.274** -0.211*	0.158 0.000 0.913 0.001 0.016 0.063
BAFWHA	0.999	Intercept BAFWPA	-0.063*** 0.968***	0.000 0.000
BAFWYLE	0.822	Intercept YEAR D0103 D9395 D0911	-1500.810*** 0.787*** -9.314*** 4.864** 6.300**	0.000 0.000 0.000 0.041 0.023

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-18. Estimation Results for Barley Planted Acres, Harvested Acres, and Expected Yields in the Northern Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
BANPPA_LEAD1	0.921	Intercept	0.117	0.796
		BANPPA	0.909***	0.000
		BACRNP	-0.004	0.893
		D11	0.909*	0.057
		D85	0.848*	0.094
		D99	0.860*	0.062
BANPHA	0.969	Intercept	-0.074	0.566
		BANPPA	0.915***	0.000
BANPYLE	0.758	Intercept	-1036.856***	0.000
		YEAR	0.545***	0.000
		D88	-23.531***	0.000
		D92	10.325**	0.021
		D02	-9.471**	0.031

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-19. Estimation Results for the U.S. Barley Seed Use

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
BAUSSE	0.994	Intercept	0.573***	0.000
		BAUSPA_LEAD1	1.571***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-20. Estimation Results for the U.S. Barley Feed Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
BAUSFE	0.897	Intercept	-141.893***	0.384
		BAUSRFP	-18.877	0.110
		CRUSRFP	12.785	0.176
		GCDU	10.772	0.560
		BAUSPR	0.592***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-21. Estimation Results for the U.S. Barley Food Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
BAUSFA	0.725	Intercept	1502.321***	0.000
		YEAR	-0.765***	0.000
		BACRRP	60.463***	0.000
		BASORP	-56.295***	0.000
		FBEXFB	43.159***	0.000
		D09	9.377***	0.008
		D9194	4.436**	0.013
		D0304	-4.868**	0.031

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-22. Estimation Results for the U.S. Barley Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
BAEX	0.884	Intercept	79.103	0.252
		BAUSRFP	-7.480*	0.069
		USREER	-0.764	0.167
		BAUSPR	0.223***	0.000
		D85	-78.838***	0.000
		D8688	32.364***	0.004
		BAEXD1	-25.938***	0.003

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-23. Estimation Results for Regional Barley Price

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
BAFWFP	0.987	Intercept	0.424***	0.000
		BAUSFP	0.921***	0.000
BANPFP	0.974	Intercept	-0.119**	0.029
		BAUSFP	1.013***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-24. Estimation Results for Cotton Planted Acres, Harvested Acres, and Expected Yields in the Delta States

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CODSPA_LEAD1	0.860	Intercept	0.867***	0.007
		CODSPA	0.716***	0.000
		COSBDS	-0.135**	0.026
		CODSPAD1	-0.854***	0.000
		D00	0.697**	0.032
		D94	0.629*	0.052
CODSHA	0.998	Intercept	-0.024	0.256
		CODSPA	0.999***	0.000
CODSYLE	0.740	Intercept	-18199.801***	0.000
		YEAR	9.513***	0.000
		D9593	-172.070***	0.002
		CODSYLD1	120.801**	0.015
		D0900	-155.717***	0.006

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-25. Estimation Results for Cotton Planted Acres, Harvested Acres, and Expected Yields in the Far West

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
COFWPA_LEAD1	0.943	Intercept	0.222	0.100
		COFWPA	0.928***	0.000
		COCRDS	-0.242**	0.049
		D97	-0.302**	0.015
		D8885	-0.353***	0.001
		D8687	0.197**	0.040
COFWHA	0.999	Intercept	-0.003	0.302
		COFWPA	0.995***	0.000
COFWYLE	0.834	Intercept	-26323.845***	0.000
		YEAR	13.823***	0.000
		D9895	-301.076***	0.000
		D87	147.046*	0.061
		COFWYLD1	132.842***	0.009

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-26. Estimation Results for Cotton Planted Acres, Harvested Acres, and Expected Yields in the South East

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
COSEPA _LEAD1	0.748	Intercept	0.840**	0.013
		COSEPA	0.701***	0.000
		COPESE	-0.002	0.869
		D9401	0.445	0.116
		D0708	-0.363	0.346
		D12	-0.238	0.651
COSEHA	0.996	Intercept	0.042	0.264
		COSEPA	0.959***	0.000
COSEYLE	0.813	Intercept	-18914.398***	0.000
		YEAR	9.804***	0.000
		D9485	-139.447***	0.000
		COSEYLD1	160.274***	0.001
		COSEYLD2	85.205**	0.031

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-27. Estimation Results for Cotton Planted Acres, Harvested Acres, and Expected Yields in the Southern Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
COSPPA _LEAD1	0.734	Intercept	4.563***	0.000
		COSPPA	0.280***	0.009
		CRCOSP	0.214	0.220
		D10	1.780***	0.000
		COSPPAD1	-0.879***	0.000
		COSPPAD2	-0776***	0.001
COSPHA	0.676	Intercept	4.387***	0.000
		COSPPA	0.155	0.305
		COSPHAD1	-1.750***	0.000
		COSPHAD2	-1.253***	0.000
		D8986	-1.197***	0.00
COSPYLE	0.826	Intercept	-9739.037**	0.033
		YEAR	5.112**	0.026
		D0407	222.048***	0.000
		D0812	106.943**	0.021

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-28. Estimation Results for the U.S. Cotton Domestic Milling Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
COUSMI	0.790	Intercept	327854.360***	0.000
		YEAR	-164.710***	0.000
		COUSRFP	-1666.141**	0.045
		SFUSPPI	55.052	0.109
		D85	-1591.760**	0.022
		D9599	1356.783***	0.000
		D0609	-862.270**	0.031

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-29. Estimation Results for the U.S. Cotton Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
COUSMI	0.844	Intercept	-24546.042***	0.001
		YEAR	125.533***	0.001
		COUSRFP	-1845.173	0.134
		USREER	-46.323	0.202
		D9800	-1480.961***	0.008
		D0205	1924.844***	0.001
		D8687	1181.500*	0.077

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-30. Estimation Results for Regional Cotton Price

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
CODSFP	0.978	Intercept	-0.013	0.466
		COUSFP	1.013***	0.000
COFWFP	0.956	Intercept	0.062**	0.021
		COUSFP	0.014***	0.000
COSEFP	0.978	Intercept	-0.032*	0.092
		COUSFP	0.107***	0.000
COSPFP	0.952	Intercept	-0.035	0.193
		COUSFP	1.002***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-31. Estimation Results for Oat Planted Acres, Harvested Acres, and Expected Yields in the Far West

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
OAFWPA _LEAD1	0.915	Intercept	0.178***	0.000
		OAFWPA	0.787***	0.000
		OACRFW	-0.022***	0.001
		D00	0.113***	0.001
		D9088	0.099***	0.000
		D9694	0.079***	0.001
OAFWHA	0.871	Intercept	-0.115***	0.000
		OAFWPA	0.110***	0.000
		D8586	0.048***	0.003
		D0103	-0.026**	0.033
OAFWYLE	0.750	Intercept	-102.745	0.609
		YEAR	0.092	0.365
		OAFWYLD1	-11.106***	0.000
		D0912	6.692***	0.003
		D8785	-5.004**	0.044

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-32. Estimation Results for Oat Planted Acres, Harvested Acres, and Expected Yields in the Lake States

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
OALSPA _LEAD1	0.967	Intercept	0.135**	0.032
		OALSPA	0.755***	0.000
		CROALS	0.165	0.348
		D86	1.158***	0.000
		D85	0.726***	0.001
OALSHA	0.915	Intercept	0.093	0.118
		OALSPA	0.595***	0.000
OALSYLE	0.715	Intercept	-374.358	0.114
		YEAR	0.218*	0.068
		OALSYLD1	-14.963***	0.000
		D85	9.992**	0.043
		D0300	7.621**	0.024

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-33. Estimation Results for Oat Planted Acres, Harvested Acres, and Expected Yields in the Northern Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
OANPPA _LEAD1	0.963	Intercept	1.103	0.113
		OANPPA	0.862***	0.000
		CROANP	0.013	0.499
		D88	0.444**	0.014
		D94	-0.444***	0.008
		D93	0.224	0.167
OANPHA	0.941	Intercept	-0.202***	0.003
		OANPPA	0.730***	0.000
OANPYLE	0.764	Intercept	-1023.679***	0.000
		YEAR	0.541***	0.000
		D8889	-21.884***	0.000
		D9293	9.796**	0.013
		D0602	-14.231***	0.001

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-34. Estimation Results for Oat Planted Acres, Harvested Acres, and Expected Yields in the Southern Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
OASPPA _LEAD1	0.914	Intercept	0.071	0.166
		OASPPA	0.903***	0.000
		OASOSP	-0.004	0.668
		D91	-0.308***	0.005
		D86	0.113	0.139
		D07	-0.126*	0.080
OASPHA	0.893	Intercept	-0.076***	0.001
		OSPPPA	0.288***	0.000
		D97	0.065**	0.018
		D91	-0.050*	0.070
		D85	0.050*	0.086
OASPYLE	0.648	Intercept	-168.771	0.270
		YEAR	0.106	0.169
		D9689	-9.164***	0.000
		OASPYLD1	7.144***	0.001
		D1106	-8.699***	0.001

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-35. Estimation Results for the U.S. Oat Seed Use

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
OAUSSE	0.909	Intercept	2.494*	0.098
		OAUSPA_LEAD1	1.876***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-36. Estimation Results for the U.S. Oat Feed Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
OAUSFE	0.985	Intercept	-158.343	0.356
		OAUSFE_LAG1	0.269***	0.000
		OAUSRFP	-27.487***	0.000
		CRUSRFP	6.845*	0.065
		GCDU	23.416	0.218
		OAUSPR	0.470***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-37. Estimation Results for the U.S. Oat Food Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
OAUSFA	0.886	Intercept	-816.143***	0.001
		YEAR	0.432***	0.000
		OAWHRP	6.700***	0.002
		D8586	-11.373***	0.000
		D8893	16.769***	0.000
		D00	-6.301**	0.048

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-38. Estimation Results for the U.S. Oat Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
OAEX	0.753	Intercept	-83.929**	0.023
		YEAR	0.046**	0.011
		OAUSRFP	-0.473**	0.022
		USREER	0.046*	0.092
		D9490	-1.299**	0.014
		D92	3.966***	0.000
		D0102	1.052*	0.056

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-39. Estimation Results for Regional Oat Price

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
OAFWFP	0.894	Intercept	0.463***	0.000
		OAUSFP	0.873***	0.000
OALSFP	0.993	Intercept	0.070**	0.024
		OAUSFP	0.922***	0.000
OANPFP	0.971	Intercept	0.044	0.471
		OAUSFP	0.933***	0.000
OASPFP	0.835	Intercept	-0.180	0.473
		OAUSFP	1.493***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-40. Estimation Results for LG Rice Planted Acres, Harvested Acres, and Expected Yields in the Delta States

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
LRDSPA_LEAD1	0.709	Intercept	0.978***	0.000
		LRDSPA	0.408***	0.001
		LRDSER_LEAD1	0.001*	0.060
		LRDSPAD1	0.463***	0.000
		D1210	-0.496***	0.001
LRDSHA	0.997	Intercept	-0.056**	0.014
		LRDSHA	1.018***	0.000
LRDSYLE	0.858	Intercept	-1513.676***	0.000
		YEAR	0.787***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-41. Estimation Results for the U.S. LG Rice Domestic and Residual Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
LRUSRE	0.898	Intercept	-2955.953***	0.000
		YEAR	1.503***	0.000
		LRMRRP	23.445***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-42. Estimation Results for the U.S. LG Rice Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
LREX	0.719	Intercept	-1708.042***	0.000
		YEAR	0.903***	0.000
		LRUSRFP	-3.058***	0.004
		THEXPRR	10.54	0.121
		USREER	-0.137	0.697
		D11	-16.139**	0.046
		D0502	16.272***	0.010
		D9794	13.467 **	0.022

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-43. Estimation Results for Regional LG Rice Price

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
LRDSFP	0.999	Intercept	0.013	0.208
		LRUSFP	0.998***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-44. Estimation Results for MSG Rice Planted Acres, Harvested Acres, and Expected Yields in the Delta States

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
MRDSPA _LEAD1	0.840	Intercept	9.889**	0.011
		YEAR	-0.005**	0.012
		MRDSPA	0.552***	0.000
		MRDSER_LEAD1	0.001**	0.013
		MRDSPAD1	-0.096***	0.000
		MRDSPAD2	0.084***	0.004
MRDSHA	0.999	Intercept	0.002	0.155
		MRDSPA	0.979***	0.000
MRDSYLE	0.896	Intercept	-1855.720***	0.000
		YEAR	0.958***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-45. Estimation Results for MSG Rice Planted Acres, Harvested Acres, and Expected Yields in the Far West

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
MRFWPA _LEAD1	0.934	Intercept	0.104***	0.002
		MRFWPA	0.754***	0.000
		MRFWER_LEAD1	0.001**	0.014
		MRDSPAD1	0.064***	0.000
		MRDSPAD2	-0.049***	0.005
		D90	-0.057**	0.011
MRFWHA	0.999	Intercept	-0.002	0.180
		MRFWPA	0.998***	0.000
MRFWYLE	0.637	Intercept	-443.466***	0.008
		YEAR	0.262***	0.002
		D9899	-8.429***	0.001
		D9194	7.152***	0.000
		D88	-6.139*	0.066

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-46. Estimation Results for the U.S. MSG Rice Domestic and Residual Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
MRUSRE	0.817	Intercept	-872.432***	0.000
		YEAR	0.455***	0.000
		MRUSRFP	-1.092***	0.000
		LRUSRFP	0.768**	0.036
		D85	-10.451***	0.002
		D9097	7.518***	0.000
		D12	-6.574***	0.004

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-47. Estimation Results for the U.S. MSG Rice Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
MREX	0.719	Intercept	-1514.822***	0.000
		YEAR	0.769***	0.000
		MRUSRFP	-1.049***	0.004
		THEXPRR	0.691***	0.008
		USREER	-0.042	0.779
		D8785	8.750***	0.002
		D8992	-5.946***	0.001
		D0810	8.524***	0.003

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-48. Estimation Results for Regional MSG Rice Price

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
MRDSFP	0.997	Intercept	-0.068	0.530
		MRUSFP	1.012***	0.000
MRFWFP	0.994	Intercept	-0.087	0.482
		MRUSFP	0.999***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-49. Estimation Results for Sorghum Planted Acres, Harvested Acres, and Expected Yields in the Central Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SOCPPA _LEAD1	0.903	Intercept	1.207***	0.007
		SOCCPA	0.763***	0.000
		SOCRCP	-0.114	0.129
		D95	1.734***	0.000
		D88	1.201***	0.003
		D96	-1.033***	0.010
SOCPHA	0.969	Intercept	-0.251	0.114
		SOCPPA	0.942***	0.000
SOCPYLE	0.744	Intercept	-358.833	0.328
		YEAR	0.217	0.241
		SOCPYLD1	-15.146***	0.000
		SOCPYLD2	9.503*	0.062
		D9492	-26.864***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-50. Estimation Results for Sorghum Planted Acres, Harvested Acres, and Expected Yields in the Southern Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SOSPPA _LEAD1	0.738	Intercept	1.618***	0.002
		SOSPPA	0.436***	0.001
		CRSOSP	1.049	0.136
		D9591	1.698***	0.000
		D0910	-0.999**	0.011
		D8687	-0.722*	0.060
SOSPHA	0.885	Intercept	-0.390	0.126
		SOSPPA	0.970***	0.000
SOSPYLE	0.602	Intercept	-518.337	0.286
		YEAR	0.296	0.225
		SOSPYLD1	-14.817***	0.004
		SOSPYLD2	9.752	0.120
		D9896	-23.576***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-51. Estimation Results for the U.S. Sorghum Seed Use

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SOUSSE	0.952	Intercept	0.025	0.630
		SOUSPA_LEAD1	0.121***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-52. Estimation Results for the U.S. Sorghum Feed Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SOUSFE	0.819	Intercept	1662.870***	0.000
		SOCRRP	388.258*	0.068
		GCCU	-73.352***	0.000
		D0096	125.303**	0.028
		D85	183.234**	0.023
		D0912	-151.501***	0.001

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-53. Estimation Results for the U.S. Sorghum Food Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SOUSFA	0.901	Intercept	-5898.356***	0.000
		YEAR	2.967***	0.000
		SOUSRFP	-63.104***	0.000
		CRUSRFP	76.251***	0.000
		WHUSRFP	-10.666***	0.003

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-54. Estimation Results for the U.S. Sorghum Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SOEX	0.743	Intercept	414.203***	0.005
		SOUSRFP	-30.739***	0.000
		USREER	-1.179	0.326
		D8891	91.605***	0.000
		D07	109.563***	0.002
		D1108	-60.582**	0.022

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-55. Estimation Results for Regional Sorghum Price

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SOCPFP	0.999	Intercept	-0.106***	0.000
		SOUSFP	1.017***	0.000
SOSPFP	0.955	Intercept	0.520***	0.000
		SOUSFP	0.821***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-56. Estimation Results for Soybean Planted Acres, Harvested Acres, and Expected Yields in the Corn Belt

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBCBPA_LEAD1	0.907	Intercept	5.955**	0.025
		SBCBPA	0.845***	0.000
		SBCRCB	-0.449	0.505
		D06	-4.899***	0.000
		D8688	-1.432*	0.010
		D07	2.710***	0.003
SBCBHA	0.993	Intercept	-0.978*	0.095
		SBCBPA	1.020***	0.000
SBCBYLE	0.779	Intercept	-763.949***	0.000
		YEAR	0.406***	0.000
		D88	-10.369***	0.000
		D03	-9.599***	0.000
		D12	-8.618	0.002

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-57. Estimation Results for Soybean Planted Acres, Harvested Acres, and Expected Yields in the Central Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBCPPA _LEAD1	0.943	Intercept	-408.885***	0.000
		YEAR	0.208***	0.000
		SBCRCP	-0.558*	0.076
		D06	-1.458***	0.003
		D9899	0.665**	0.048
SBCPHA	0.997	Intercept	-0.012	0.870
		SBCPPA	0.979***	0.000
SBCPYLE	0.628	Intercept	-1136.770***	0.000
		YEAR	0.588***	0.000
		D12	-13.068***	0.003
		D0200	-7.107**	0.015
		D9694	5.977**	0.038

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-58. Estimation Results for Soybean Planted Acres, Harvested Acres, and Expected Yields in the Delta States

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBDSPA _LEAD1	0.826	Intercept	1.981***	0.002
		SBDSPA	0.700***	0.000
		SBCRDS	-0.095	0.622
		D0600	-1.117***	0.000
		D07	1.086***	0.009
		D96	0.793**	0.034
SBDSHA	0.987	Intercept	0.204	0.148
		SBDSPA	0.938***	0.000
SBDSYLE	0.830	Intercept	-1316.448***	0.000
		YEAR	0.674***	0.000
		D00	-7.539***	0.009
		D98	-6.442**	0.022
		D92	6.285**	0.027

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-59. Estimation Results for Soybean Planted Acres, Harvested Acres, and Expected Yields in the Lake States

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBLSPA _LEAD1	0.947	Intercept	0.352	0.460
		SBLSPA	1.027***	0.000
		SBCRLS	-0.483	0.124
		D06	-1.464***	0.003
		D07	1.036***	0.027
SBLSHA	0.998	Intercept	-0.184**	0.017
		SBLSPA	1.004***	0.000
SBLSYLE	0.735	Intercept	-474.409***	0.001
		YEAR	0.257***	0.001
		D9388	-10.193***	0.000
		D0304	-7.890***	0.000
		D0506	3.535*	0.082

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-60. Estimation Results for Soybean Planted Acres, Harvested Acres, and Expected Yields in the North East

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBNEPA _LEAD1	0.905	Intercept	-40.036***	0.000
		YEAR	0.021***	0.000
		SBCRNE	-0.051*	0.078
		D86	-0.125*	0.051
		D88	0.123*	0.055
		D06	-0.145**	0.020
SBNEHA	0.998	Intercept	-0.024*	0.058
		SBNEPA	0.999***	0.000
SBNEYLE	0.734	Intercept	-791.684***	0.000
		YEAR	0.414***	0.000
		SBNEYLD1	-8.293***	0.000
		D0400	6.299***	0.006
		D90	5.688*	0.065

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-61. Estimation Results for Soybean Planted Acres, Harvested Acres, and Expected Yields in the Northern Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBNPPA _LEAD1	0.962	Intercept	-619.591***	0.000
		YEAR	0.313***	0.000
		SBCRNP	-0.410	0.219
		D06	-1.022*	0.067
		D0103	1.046***	0.002
SBNPHA	0.999	Intercept	-0.019	0.329
		SBNPPA	0.988***	0.000
SBNPYLE	0.686	Intercept	-259.993**	0.050
		YEAR	0.146**	0.030
		D9388	-8.380***	0.000
		SBNPYLD1	5.523***	0.001
		D0907	5.056**	0.014

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-62. Estimation Results for Soybean Planted Acres, Harvested Acres, and Expected Yields in the South East

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBSEPA _LEAD1	0.822	Intercept	2.316***	0.000
		SBSEPA	0.634***	0.000
		SBCOSE	-0.138*	0.092
		SBPESE	-0.057**	0.036
		D8788	0.890***	0.002
		D07	1.067***	0.006
		D09	-0.464	0.205
SBSEHA	0.983	Intercept	0.378**	0.012
		SBSEPA	0.896***	0.000
SBSEYLE	0.780	Intercept	-778.248***	0.000
		YEAR	0.405***	0.000
		D1007	-8.252***	0.000
		D99	-9.225***	0.001
		SBSEYLD1	4.820***	0.004

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-63. Estimation Results for the U.S. Soybean Seed, Feed, and Residual Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBUSSE	0.790	Intercept	126.084***	0.005
		SBUSPA_LEAD1	1.588***	0.005
		SBUSRFP	-7.132	0.126
		SMUSRFP	-150.576	0.262
		D0405	30.941**	0.028
		D0203	-27.092**	0.043
		D12	37.791*	0.078

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-64. Estimation Results for the U.S. Soybean Crushing Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBUSCRU	0.927	Intercept	-59745.887***	0.000
		YEAR	30.600***	0.000
		SBCRUMRFP	375.384*	0.071
		D1012	-216.337***	0.000
		D98	150.566**	0.042
		D0001	89.332*	0.089

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-65. Estimation Results for the U.S. Soybean Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBEX	0.887	Intercept	31424.974**	0.013
		YEAR	16.202**	0.012
		SBEX_LAG1	0.449**	0.013
		SBUSRP	-129.241	0.259
		USREER	-2.826	0.346
		D8785	153.203*	0.089
		SBEXD1	-182.338**	0.015

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-66. Estimation Results for Regional Soybean Price

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SBCBFP	0.991	Intercept SBUSFP	-0.114 1.025***	0.435 0.000
SBCPFP	0.994	Intercept SBUSFP	-0.022 0.976***	0.837 0.000
SBDSFP	0.963	Intercept SBUSFP	0.301 0.962***	0.273 0.000
SBLSFP	0.993	Intercept SBUSFP	0.029 0.977***	0.813 0.000
SBNEFP	0.982	Intercept SBUSFP	-0.285 1.046***	0.171 0.000
SBNPFP	0.991	Intercept SBUSFP	-0.283* 0.994***	0.052 0.000
SBSEFP	0.980	Intercept SBUSFP	-0.190 1.040***	0.377 0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-67. Estimation Results for the U.S. Soybean Meal Production

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SMUSPR	0.998	Intercept SBUSCRU	0.060 0.024***	0.846 0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-68. Estimation Results for the U.S. Soybean Meal Domestic Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SMUSRE	0.970	Intercept	-5.521***	0.004
		POULTRY	0.280***	0.000
		SMUSRFP	-4.845**	0.012
		D87	2.226**	0.023
		D06	1.640*	0.068
		D11	0.886*	0.061
SMEX	0.704	Intercept	-254.369***	0.000
		YEAR	0.138***	0.000
		SMUSRFP	-7.577**	0.029
		USREER	-0.114***	0.007
		D09	2.307**	0.016
		D8587	2.712***	0.004
		D9593	-1.316*	0.057

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-69. Estimation Results for the U.S. Soybean Oil Production

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SLUSPR	0.989	Intercept	-1158.428***	0.004
		SBUSCRU	12.058***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-70. Estimation Results for the U.S. Soybean Oil Domestic Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
SLUSRE	0.926	Intercept	-561606.61***	0.000
		YEAR	286.312***	0.000
		SLCSRP	3747.693***	0.000
		D08	-1357.578*	0.092
		D01	1442.802*	0.068
		D03	1095.040	0.165
SLEX	0.658	Intercept	1963.458	0.308
		SLUSRFP	-3775.748*	0.082
		CSUSRP	4581.616***	0.007
		USREER	-7.201	0.663
		D0910	1523.219***	0.000
		D9590	-756.321**	0.029
		D9794	1168.891***	0.001

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-71. Estimation Results for Wheat Planted Acres, Harvested Acres, and Expected Yields in the Corn Belt

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHCBPA_LEAD1	0.790	Intercept	2.076***	0.000
		WHCBPA	0.589***	0.000
		WHSBCB	-0.217	0.410
		D8889	1.316**	0.012
		WHCBPAD1	-0.309***	0.001
		D04	-1.281**	0.031
WHCBHA	0.941	Intercept	0.125	0.483
		WHCBPA	0.873***	0.000
WHCBYLE	0.750	Intercept	-871.468***	0.000
		YEAR	0.463***	0.000
		D9691	-14.436***	0.000
		D0503	7.613**	0.014
		D9900	6.256**	0.036

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-72. Estimation Results for Wheat Planted Acres, Harvested Acres, and Expected Yields in the Central Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHCPPA _LEAD1	0.873	Intercept	2.728**	0.027
		WHCPPA	0.851***	0.000
		WHSBCP	-0.309	0.172
		D88	2.872***	0.000
		D06	1.289**	0.047
		D07	-1.239*	0.052
WHCPHA	0.929	Intercept	0.375	0.647
		WHCPPA	0.896***	0.000
		D0402	-1.240***	0.001
		D9689	-2.721***	0.000
WHCPYLE	0.775	Intercept	-347.786***	0.010
		YEAR	0.193***	0.005
		WHCPYLD1	8.068***	0.000
		WHCPYLD2	-7.597***	0.000
		D0602	-7.039***	0.001

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-73. Estimation Results for Wheat Planted Acres, Harvested Acres, and Expected Yields in the Delta States

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHDSPA _LEAD1	0.739	Intercept	0.721***	0.001
		WHDSPA	0.494***	0.001
		WHCRDS	-0.006	0.654
		WHDSPAD1	-0.789***	0.000
		D8889	0.642***	0.005
		D1006	0.361	0.108
WHDSHA	0.985	Intercept	-0.043	0.188
		WHDSPA	0.924***	0.000
WHDSYLE	0.816	Intercept	-1504.339***	0.000
		YEAR	0.776***	0.000
		D91	-19.288***	0.000
		D88	11.477***	0.009
		WHDSYLD1	7.628***	0.003

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-74. Estimation Results for Wheat Planted Acres, Harvested Acres, and Expected Yields in the Far West

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHFWPA_LEAD1	0.757	Intercept	4.409***	0.000
		WHFWPA	0.318***	0.003
		WHBAFW	-0.719*	0.055
		D9088	0.881***	0.000
		D0306	-0.394***	0.006
		D8687	0.167***	0.000
WHFWHA	0.968	Intercept	-0.333	0.156
		WHFWPA	0.988***	0.000
		D91	-1.432***	0.000
		D96	0.160*	0.083
		D89	-0.615***	0.000
WHFWYLE	0.710	Intercept	-938.728***	0.000
		YEAR	0.501***	0.000
		D11	8.048**	0.019
		D0102	-5.669**	0.018
		WHFWYLD1	6.788***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-75. Estimation Results for Wheat Planted Acres, Harvested Acres, and Expected Yields in the Lake States

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHLSPA_LEAD1	0.812	Intercept	0.624*	0.058
		WHLSPA	0.846***	0.000
		WHSBLS	-0.151	0.130
		WHLSPAD1	0.601***	0.000
		D9986	-0.562***	0.007
		D11	-0.450**	0.049
WHLSHA	0.962	Intercept	0.134	0.216
		WHLSPA	0.909***	0.000
WHLSYLE	0.763	Intercept	-1706.350***	0.000
		YEAR	0.876***	0.000
		D9085	14.585***	0.001
		WHLSYLD1	-9.894***	0.005
		D03	9.743*	0.059

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-76. Estimation Results for Wheat Planted Acres, Harvested Acres, and Expected Yields in the Northern Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHNPPA_LEAD1	0.894	Intercept	5.914***	0.003
		WHNPPA	0.712***	0.000
		WHCRNP	-0.686**	0.013
		WHNPPAD1	3.727***	0.000
		D9086	-1.486**	0.011
		D97	-1.794**	0.027
WHNPHA	0.967	Intercept	1.193	0.107
		WHNPPA	0.886***	0.000
		D88	-3.124***	0.000
		D0102	-2.181***	0.000
		D85	-1.632***	0.000
WHNPYLE	0.704	Intercept	-764.554***	0.000
		YEAR	0.399***	0.000
		D88	-131.811***	0.000
		D02	-8.480**	0.012
		D9290	5.046**	0.041

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-77. Estimation Results for Wheat Planted Acres, Harvested Acres, and Expected Yields in the South East

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHSEPA_LEAD1	0.739	Intercept	1.676***	0.000
		WHSEPA	0.483***	0.000
		WHPESE	-0.041*	0.060
		D8788	0.607***	0.003
		WHSEPAD1	-0.766***	0.000
		D12	0.580**	0.030
WHSEHA	0.952	Intercept	-0.646***	0.000
		WHSEPA	1.019***	0.000
WHSEYLE	0.773	Intercept	-2178.513***	0.000
		YEAR	1.114***	0.000
		D1007	-13.122***	0.001
		D88	11.894**	0.017
		D9492	9.440***	0.009

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-78. Estimation Results for Wheat Planted Acres, Harvested Acres, and Expected Yields in the Southern Plains

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHSPPA_LEAD1	0.840	Intercept	3.431***	0.002
		WHSPPA	0.735***	0.000
		WHCRSP	-0.012	0.826
		D0102	0.951**	0.016
		D04	-1.280**	0.017
		D0910	-1.019**	0.021
WHSPHA	0.737	Intercept	-3.914**	0.030
		WHSPPA	0.919***	0.000
		D06	-1.913**	0.035
		D09	-1.534*	0.078
		D1008	1.144*	0.085
WHSPYLE	0.767	Intercept	-359.291***	0.003
		YEAR	0.195***	0.001
		D9496	-6.715***	0.000
		WHSPYLD1	-9.548***	0.000
		D9899	5.073***	0.003

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-79. Estimation Results for the U.S. Wheat Seed Use

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHUSSE	0.910	Intercept	-4.289	0.446
		WHUSPA_LEAD1	1.413***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-80. Estimation Results for the U.S. Wheat Feed and Residual Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHUSRE	0.717	Intercept	319.511**	0.018
		WHUSRP	-392.322***	0.000
		WHCRRP	212.126*	0.069
		WHSMRP	2666.998**	0.037
		D09	-235.022***	0.001
		D94	156.624**	0.014
		D03	-114.262*	0.070

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-81. Estimation Results for the U.S. Wheat Food Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHUSFA	0.975	Intercept	50.669*	0.082
		WHUSFA_LAG1	0.912***	0.000
		WHSORP	54.941**	0.039
		D92	32.621**	0.028
		D94	-26.956*	0.061
		D01	-29.522**	0.044

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-82. Estimation Results for the U.S. Wheat Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHEX	0.721	Intercept	16789.989***	0.007
		YEAR	-7.271**	0.015
		WHUSRFP	-21.647	0.120
		USREER	-10.514**	0.011
		D8788	235.816**	0.026
		WHEXD1	166.083**	0.039
		D1007	282.104***	0.001

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-83. Estimation Results for Regional Wheat Price

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
WHCBFP	0.969	Intercept WHUSFP	0.148 0.867***	0.252 0.000
WHCPFP	0.987	Intercept WHUSFP	-0.053 0.983***	0.569 0.000
WHDSFP	0.909	Intercept WHUSFP	0.504** 0.800***	0.021 0.000
WHFWFP	0.975	Intercept WHUSFP	0.231* 0.992***	0.083 0.000
WHLSFP	0.988	Intercept WHUSFP	-0.092 1.016***	0.327 0.000
WHNPFP	0.987	Intercept WHUSFP	-0.200* 1.110***	0.063 0.000
WHSEFP	0.959	Intercept WHUSFP	0.228 0.849***	0.123 0.000
WHSPFP	0.974	Intercept WHUSFP	-0.106 1.007***	0.438 0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-84. Estimation Results for Peanut Planted Acres, Harvested Acres, and Expected Yields in the South East

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
PESEPA _LEAD1	0.787	Intercept YEAR COPESE PESEPAD1 D8990 D9596	24.789*** -0.012*** 0.002 0.322*** 0.296*** -0.111*	0.000 0.000 0.416 0.000 0.000 0.064
PESEHA	0.998	Intercept PESEPA	-0.025** 0.999***	0.027 0.000
PESEYLE	0.726	Intercept YEAR PESEYLD1 D1112	-50155.307*** 26.526*** -446.575*** 464.264**	0.001 0.000 0.005 0.025

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-85. Estimation Results for the U.S. Peanut Seed, Loss, Shrinkage, and Residual Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
PEUSSE	0.713	Intercept	-16586.577***	0.004
		YEAR	8.498***	0.003
		D8785	389.260***	0.000
		PEUSSED1	-145.689***	0.006

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-86. Estimation Results for the U.S. Peanut Crushing Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
PEUSCRU	0.725	Intercept	24266.261**	0.016
		YEAR	-11.857**	0.019
		PECRUMRR	205.721	0.447
		PEUSCRUD1	382.391***	0.000
		PEUSCRUD2	216.442**	0.013

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-87. Estimation Results for the U.S. Peanuts Food Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
PEUSFA	0.885	Intercept	2898.250***	0.000
		PEUSRFP	-1678.648***	0.000
		D1012	415.626***	0.000
		D0102	-231.472***	0.004
		D9496	-216.341***	0.001

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-88. Estimation Results for the U.S. Peanuts Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
PEEX	0.831	Intercept	81421.075***	0.000
		YEAR	-39.364***	0.000
		PEUSRFP	-3075.609***	0.000
		USREER	-10.089***	0.003
		PEEXD1	219.035***	0.000
		D12	789.065***	0.000
		D0206	-312.043***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-89. Estimation Results for the U.S. Corn Byproduct Prices

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
DDGMP	0.787	Intercept	0.079***	0.000
		CRUSFP	0.024***	0.000
		NGIMP	-0.006***	0.001
GFUSMP	0.631	Intercept	0.033***	0.002
		CRUSFP	0.021***	0.000
GMUSMP	0.839	Intercept	0.093***	0.000
		CRUSFP	0.082***	0.000
CLUSMP	0.746	Intercept	-0.121***	0.020
		SLUSRFP	1.230***	0.000

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-90. Estimation Results for the U.S. Ethanol Production by Milling Type

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
ETDMPR	0.914	Intercept	-939537982***	0.000
		YEAR	469933***	0.000
		DMOPMRR	2453342***	0.002
		D1012	4913017***	0.000
		D0007	-3021400***	0.002
ETWMPR	0.882	Intercept	-61310743***	0.000
		YEAR	31128***	0.000
		WMOPMRR	11865	0.832
		D9495	274168***	0.001
		D0309	-157113**	0.013
		D9702	87219*	0.059

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-91. Estimation Results for the U.S. Ethanol Domestic Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
ETUSDE	0.990	Intercept	93223389.949*	0.084
		MVUS	13.900***	0.000
		RFCORP	59758.291***	0.003
		ETUSRP	-1525111.559***	0.003
		D0502	-997150.386***	0.006
		D0910	1632036.664***	0.002

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-92. Estimation Results for the U.S. Ethanol Net Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
ETEXN	0.930	Intercept	25818326.401**	0.015
		YEAR	-12848.887**	0.015
		RFCORP	7367.136***	0.000
		ETUSRP	-184767.121**	0.015
		D11	859690.315***	0.000
		D0608	-628163.273***	0.000
		D09	-279046.557***	0.003

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-93. Estimation Results for the U.S. Biodiesel Production from Soybean Oil

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
BDSLPR	0.761	Intercept	-77265401.845***	0.007
		YEAR	38575.009***	0.007
		BDOPMRR	14664.274	0.643
		D0608	128896.060*	0.071

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-94. Estimation Results for the U.S. Biodiesel Domestic Demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
BDUSDE	0.918	Intercept	-94202586.587***	0.002
		YEAR	47120.443***	0.002
		MVBDRP	-71875.835	0.201
		D0608	183411.013**	0.010

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-95. Estimation Results for the U.S. Biodiesel Net Export demand

Dependent Variable	Adj. R^2	Independent Variable(s)	Coefficient	P-value
BDEXN	0.945	Intercept	-295.349	0.951
		BDEXN_LAG1	0.916***	0.000
		BD100RP	-1632.997	0.495
		D0708	197954.897***	0.000
		D0910	-110659.011***	0.002
		D12	62088.723***	0.007

Note: ***, **, * denote statistical significance at the 1%, 5%, and 10% level.

Table C-96. Model Validation Results Using With-in Samples

Variable	MAPE	RMSE	Variable	MAPE	RMSE
BAEX	12.235	0.587	CRDSHA	2.592	0.036
BAFWHA	0.828	0.015	CRDSPA_LEAD1	16.541	0.182
BAFWPA_LEAD1	5.402	0.097	CRDSYLE	6.024	8.386
BAFWYL	3.677	3.256	CREX	8.289	196.220
BANPHA	4.670	0.247	CRFWHA	7.034	0.036
BANPPA_LEAD1	8.771	0.310	CRFWPA_LEAD1	5.280	0.063
BANPYL	5.016	3.644	CRFWYLE	1.491	3.191
BAUSFA	1.196	2.238	CRLSHA	1.067	0.174
BAUSFE	15.676	19.188	CRLSPA_LEAD1	2.721	0.438
BAUSSE	2.828	0.283	CRLSYLE	4.529	7.643
CODSHA	0.931	0.028	CRNEHA	2.521	0.073
CODSPA_LEAD1	7.846	0.219	CRNEPA_LEAD1	2.268	0.099
CODSYLE	6.109	61.427	CRNEYLE	5.983	7.762
COEX	14.183	678.995	CRNPHA	5.922	0.306
COFWHA	0.356	0.005	CRNPPA_LEAD1	6.939	0.455
COFWPA_LEAD1	10.428	0.080	CRNPYLE	6.441	7.562
COFWYLE	4.047	63.706	CRSEHA	2.760	0.141
COSEHA	1.549	0.064	CRSEPA_LEAD1	4.004	0.251
COSEPA_LEAD1	13.318	0.443	CRSEYLE	7.338	8.987
COSEYLE	6.405	47.900	CRSPHA	3.010	0.075
COSPHA	8.109	0.438	CRSPPA_LEAD1	6.468	0.174
COSPPA_LEAD1	4.056	0.306	CRSPYLE	3.916	6.292
COSPYLE	7.749	48.270	CRUSFE	3.557	212.562
COUSMI	10.914	503.989	CRUSFI	3.097	51.777
CRCBHA	0.539	0.287	CRUSSE	0.272	0.099
CRCBPA_LEAD1	2.116	0.985	LRDSHA	0.640	0.016
CRCBYLE	4.842	8.135	LRDSPA_LEAD1	6.182	0.132
CRCPHA	1.706	0.338	LRDSYL	3.649	2.531
CRCPPA_LEAD1	2.731	0.433	LREX	6.752	5.757
CRCPYLE	2.617	4.669	LRUSRE	5.970	5.682

Table C-96 (Continued)

Variable	MAPE	RMSE	Variable	MAPE	RMSE
MRDSHA	0.695	0.002	PEUSSE	34.460	73.381
MRDSPA_LEAD1	12.668	0.035	SBCBHA	0.365	0.213
MRDSYL	3.435	2.586	SBCBPA_LEAD1	1.679	0.673
MREX	8.343	1.994	SBCBYLE	3.868	2.037
MRFWHA	0.283	0.001	SBCPHA	1.040	0.096
MRFWPA_LEAD1	3.043	0.017	SBCPPA_LEAD1	4.739	0.377
MRFWYL	2.659	2.690	SBCPYLE	7.422	3.323
MRUSRE	4.670	2.099	SBDSHA	1.273	0.098
OAEX	22.402	0.483	SBDSPA_LEAD1	3.754	0.287
OAFWHA	11.870	0.015	SBDSYLE	6.293	2.337
OAFWPA_LEAD1	3.788	0.023	SBEX	5.972	78.991
OAFWYLE	2.596	2.559	SBLSHA	0.553	0.073
OALSHA	10.045	0.138	SBLSPA_LEAD1	3.460	0.355
OALSPA_LEAD1	10.307	0.139	SBLSYLE	4.992	2.316
OALSYLE	5.227	3.846	SBNEHA	0.473	0.008
OANPHA	8.036	0.053	SBNEPA_LEAD1	2.653	0.043
OANPPA_LEAD1	9.817	0.114	SBNEYLE	6.221	2.553
OANPYLE	6.846	4.338	SBNPHA	0.757	0.042
OASPHA	12.910	0.022	SBNPPA_LEAD1	8.470	0.426
OASPPA_LEAD1	6.008	0.060	SBNPYLE	6.214	2.221
OASPYLE	4.262	2.657	SBSEHA	1.470	0.122
OAUSFA	3.064	2.581	SBSEPA_LEAD1	3.840	0.286
OAUSFE	6.217	12.465	SBSEYLE	5.551	2.085
OAUSSE	9.906	2.364	SBUSCRU	2.850	57.630
PEEX	8.310	70.166	SBUSSE	9.710	14.105
PESEHA	0.548	0.008	SLEX	15.142	288.905
PESEPA_LEAD1	5.118	0.074	SLUSRE	2.800	649.771
PESEYLE	5.457	211.842	SMEX	8.289	0.723
PEUSCRU	11.800	85.737	SMUSRE	2.259	0.721
PEUSFA	2.932	85.916	SOCPHA	4.085	0.194

Table C-96 (Continued)

Variable	MAPE	RMSE	Variable	MAPE	RMSE
SOCPPA_LEAD1	4.818	0.281	WHFWHA	1.099	0.073
SOCPYLE	8.354	7.183	WHFWPA_LEAD1	2.551	0.189
SOEX	9.843	26.568	WHFWYLE	3.241	2.697
SOSPHA	8.746	0.300	WHLSHA	1.754	0.083
SOSPPA_LEAD1	8.410	0.361	WHLSPA_LEAD1	4.592	0.187
SOSPYLE	4.847	3.200	WHLSYLE	7.686	4.339
SOUSFA	20.734	7.218	WHNPHA	1.648	0.350
SOUSFE	13.636	36.937	WHNPPA_LEAD1	2.503	0.618
SOUSSE	6.022	0.075	WHNPYLE	6.639	2.759
WHCBHA	4.631	0.245	WHSEHA	4.412	0.109
WHCBPA_LEAD1	8.364	0.404	WHSEPA_LEAD1	6.202	0.212
WHCBYLE	5.085	3.443	WHSEYLE	6.805	3.969
WHCPHA	2.151	0.394	WHSPHA	7.187	0.733
WHCPPA_LEAD1	2.848	0.523	WHSPPA_LEAD1	2.356	0.402
WHCPYLE	5.214	2.300	WHSPYLE	5.135	1.860
WHDSHA	2.969	0.054	WHUSFA	1.135	11.190
WHDSPA_LEAD1	13.712	0.217	WHUSRE	22.217	53.623
WHDSYLE	6.049	3.456	WHUSSE	2.577	2.976
WHEX	5.115	73.733			

Table C-97. Major Assumptions for Baseline Forecast in Compared Studies

Assumption	This Study (Baseline)	USDA (2014)	FAPRI (2013)
Global Economic Growth	N/A	3.2% annually	2.5~4.0%
U.S. Economic Growth	N/A	2.6% annually	1.7~3.4%
Value of the U.S. Dollar	Same with the 2012 level	A moderate appreciation	A moderate depreciation
Crude Oil Prices	$71.6~87.7/Barrel	$102.4~141.0/Barrel	$80.7~105.1/Barrel
Agricultural Policy	- the 2008 FB maintained - CRP and ACRE not considered	- the 2008 FB maintained - CRP and ACRE considered	- the 2008 FB maintained - CRP and ACRE considered
Biofuel Policy	- Blending wall not considered - No Tax Credits after 2013	- Blending wall considered - No Tax Credits after 2013	- Blending wall not considered - No Tax Credits after 2013
International Trade	Assumed to be exogenous	Assumed to be endogenous	Assumed to be endogenous
U.S. Livestock Sector	Assumed to be exogenous	Assumed to be endogenous	Assumed to be endogenous
Covered Commodities	Barley, corn, cotton, oats, LG rice, MSG rice, sorghum, soybeans, soybean meal, soybean oil, wheat, peanuts	Barley, corn, cotton, oats, LG rice, MSG rice, sorghum, soybeans, soybean meal, soybean oil, wheat, peanuts, beef, pork, poultry, dairy, sugar	Barley, corn, cotton, oats, rice (total), sorghum, soybeans, soybean meal, soybean oil, wheat, peanuts, hay, cattle, hog, meat, dairy, sugar

Table C-98. Major Assumptions for 2014 Farm Bill Forecast in Compared Studies

Assumption	This Study (2014 Farm Bill)	FAPRI (2014)
Global Economic Growth	N/A	2.5~3.9%
U.S. Economic Growth	N/A	2.3~3.4%
Value of the U.S. Dollar	Same with the 2012 level	A moderate depreciation
Crude Oil Prices	$71.6~87.7/Barrel	$93.6~109.1/Barrel
Agricultural Policy	- the 2014 FB replace the 2008 FB - SCO, STAX, and CRP not considered	- the 2014 FB replace the 2008 FB - SCO, STAX, CRP considered
Biofuel Policy	- Blending wall not considered - No Tax Credits after 2013	- Blending wall not considered - No Tax Credits after 2013
International Trade	Assumed to be exogenous	Assumed to be endogenous
U.S. Livestock Sector	Assumed to be exogenous	Assumed to be endogenous
Covered Commodities	Barley, corn, cotton, oats, LG rice, MSG rice, sorghum, soybeans, soybean meal, soybean oil, wheat, peanuts	Barley, corn, cotton, oats, rice (total), sorghum, soybeans, soybean meal, soybean oil, wheat, peanuts, hay, cattle, hog, meat, dairy, sugar

Table C-99. Comparison of the Baseline Forecast Results by USDA, FAPRI, and This Study

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average	% Diffe-rence
Corn	Planted Acres (Mil. Acres)	This Study	97.38	88.02	89.62	89.54	90.55	91.02	91.81	92.45	93.17	91.51	0.00
		USDA (2014)	95.30	93.50	91.00	89.00	88.00	88.00	88.00	88.50	88.50	89.98	1.70
		FAPRI (2013)	96.90	92.60	91.00	91.10	91.50	91.60	91.30	91.00	90.80	91.98	-0.51
	Harvested Acres (Mil. Acres)	This Study	89.03	80.17	81.70	81.61	82.57	83.00	83.75	84.35	85.04	83.47	0.00
		USDA (2014)	87.20	86.10	83.60	81.60	8.60	80.60	80.60	81.10	81.10	74.50	12.04
		FAPRI (2013)	88.80	84.80	83.40	83.40	83.90	83.90	83.70	83.40	83.20	84.28	-0.96
	Yields (Bushels/Acre)	This Study	140.87	160.31	161.99	163.58	165.22	166.84	168.48	170.10	171.74	163.24	0.00
		USDA (2014)	160.40	165.60	167.60	169.60	171.60	173.60	175.60	177.60	179.60	171.24	-4.68
		FAPRI (2013)	161.80	164.30	166.30	168.60	170.80	172.60	174.80	176.90	178.70	170.53	-4.28
	Total Supply (Mil. Bushels)	This Study	13981.2	13758.3	14140.6	14256.4	14547.6	14754.6	15015.9	15254.7	15509.7	14579.88	0.00
		USDA (2014)	14837.0	16172.0	16642.0	16742.0	16662.0	16617.0	16692.0	16757.0	16822.0	16438.11	-11.30
		FAPRI (2013)	14999.0	15600.0	15682.0	15856.0	16116.0	16319.0	16472.0	16632.0	16765.0	16049.00	-9.15
	Total Demand (Mil. Bushels)	This Study	13981.2	13758.3	14140.6	14256.3	14547.6	14754.6	15015.9	15254.7	15509.7	14579.88	0.00
		USDA (2014)	14837.0	16172.0	16642.0	16742.0	16662.0	16627.0	16617.0	16692.0	16757.0	16416.44	-11.19
		FAPRI (2013)	14999.0	15600.0	15682.0	15856.0	16116.0	16319.0	16472.0	16632.0	16765.0	16049.00	-9.15
	Farm Price (US$/Bushel)	This Study	4.27	4.76	4.54	4.68	4.59	4.59	4.54	4.51	4.46	4.55	0.00
		USDA (2014)	4.50	3.65	3.30	3.35	3.45	3.60	3.75	3.85	3.95	3.71	22.57
		FAPRI (2013)	5.18	4.69	4.73	4.79	4.83	4.88	4.88	4.87	4.84	4.85	-6.29
	Expected Net Returns (US$/Acre)	This Study	613.8	436.3	517.6	482.6	507.5	492.1	494.6	485.9	481.8	501.36	0.00
		USDA (2014)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		FAPRI (2013)	495.8	429.6	442.7	460.2	473.8	482.5	485.4	485.4	479.5	470.5	6.5

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

Table C-99 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average	% Difference
Barley	Planted Acres (Mil. Acres)	This Study	3.46	3.34	3.27	3.22	3.17	3.13	3.09	3.06	3.03	3.20	0.00
		USDA (2014)	3.50	3.10	3.10	3.00	3.00	2.90	2.90	2.90	2.90	3.03	5.36
		FAPRI (2013)	3.47	3.23	3.21	3.17	3.18	3.17	3.16	3.14	3.15	3.21	-0.40
	Harvested Acres (Mil. Acres)	This Study	3.03	2.92	2.86	2.81	2.76	2.73	2.70	2.67	2.64	2.79	0.00
		USDA (2014)	3.00	2.70	2.70	2.60	2.60	2.50	2.50	2.50	2.50	2.62	6.38
		FAPRI (2013)	3.05	2.84	2.82	2.78	2.79	2.78	2.77	2.76	2.76	2.82	-0.97
	Yields (Bushels/Acre)	This Study	62.87	70.20	71.30	72.11	72.90	73.74	74.51	75.28	76.04	72.10	0.00
		USDA (2014)	71.70	70.00	70.60	71.20	71.90	72.50	73.10	73.80	74.40	72.13	-0.04
		FAPRI (2013)	69.50	70.70	71.30	72.00	72.60	73.20	73.80	74.40	75.00	72.50	-0.55
	Total Supply (Mil. Bushels)	This Study	284.8	274.7	273.7	272.3	271.5	271.2	270.9	270.8	270.9	273.41	0.00
		USDA (2014)	320.0	294.0	301.0	303.0	303.0	298.0	296.0	297.0	295.0	300.78	-9.10
		FAPRI (2013)	288.0	288.0	292.0	293.0	294.0	296.0	296.0	296.0	299.0	293.56	-6.86
	Total Demand (Mil. Bushels)	This Study	284.8	274.8	273.7	272.3	271.0	271.0	270.7	270.7	270.8	273.30	0.00
		USDA (2014)	320.0	294.0	301.0	313.0	313.0	298.0	296.0	297.0	295.0	303.00	-9.80
		FAPRI (2013)	280.0	283.0	287.0	287.0	286.0	285.0	285.0	285.0	284.0	284.67	-3.99
	Farm Price (US$/Bushel)	This Study	4.31	5.35	5.39	5.63	5.74	5.89	6.02	6.16	6.29	5.64	0.00
		USDA (2014)	6.00	4.60	3.70	3.60	3.70	3.80	3.95	4.05	4.10	4.17	35.40
		FAPRI (2013)	4.72	4.44	4.37	4.47	4.49	4.61	4.62	4.68	4.66	4.56	23.66
	Expected Net Returns (US$/Acre)	This Study	276.9	182.3	254.5	259.9	278.5	288.7	301.7	313.1	325.5	275.67	0.00
		USDA (2014)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		FAPRI (2013)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

Table C-99 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average	% Diffe-rence
Cotton	Planted Acres (Mil. Acres)	This Study	9.73	10.65	11.40	11.72	11.84	11.86	11.82	11.75	11.67	11.38	0.00
		USDA (2014)	10.10	11.00	10.00	9.90	9.80	9.90	10.00	10.00	10.10	10.09	12.82
		FAPRI (2013)	9.45	9.89	9.93	10.03	10.00	9.89	9.84	9.78	9.68	9.83	15.76
	Harvested Acres (Mil. Acres)	This Study	9.04	9.64	10.18	10.51	10.69	10.75	10.75	10.70	10.64	10.32	0.00
		USDA (2014)	7.60	9.40	8.50	8.40	8.30	8.40	8.50	8.50	8.60	8.47	21.92
		FAPRI (2013)	7.90	8.29	8.31	8.41	8.39	8.31	8.25	8.21	8.13	8.24	25.21
	Yields (Pounds/Acre)	This Study	805.80	718.80	742.40	760.45	773.48	783.34	790.59	796.60	801.80	774.81	0.00
		USDA (2014)	790.00	795.00	800.00	805.00	810.00	815.00	820.00	825.00	830.00	810.00	-4.34
		FAPRI (2013)	810.00	817.00	825.00	833.00	842.00	850.00	859.00	867.00	875.00	842.00	-7.98
	Total Supply (Mil. Pounds)	This Study	9712.2	8410.2	9041.6	9474.9	9745.6	9904.2	9978.2	10007.8	10013.7	9587.61	0.00
		USDA (2014)	7770.7	8903.5	8934.7	8893.9	8781.1	8884.3	8963.5	9066.7	9241.9	8826.72	8.62
		FAPRI (2013)	8692.8	8846.4	9057.6	9120.0	9129.6	9134.4	9168.0	9172.8	9192.0	9057.07	5.86
	Total Demand (Mil. Pounds)	This Study	9712.2	8410.2	9041.6	9474.9	9745.6	9904.2	9978.2	10007.8	10013.7	9587.61	0.00
		USDA (2014)	7763.5	8898.7	8929.9	8889.1	8776.3	8879.5	8958.7	9061.9	9237.1	8821.65	8.68
		FAPRI (2013)	8745.6	8616.0	8784.0	9043.2	9110.4	9139.2	9139.2	9163.2	9134.4	8986.13	6.69
	Farm Price (US$/lb)	This Study	0.88	1.24	1.05	0.92	0.83	0.77	0.74	0.72	0.71	0.87	0.00
		USDA (2014)	0.74	0.64	0.62	0.62	0.62	0.64	0.66	0.68	0.70	0.66	32.75
		FAPRI (2013)	0.70	0.69	0.68	0.69	0.69	0.70	0.71	0.71	0.71	0.70	25.36
	Expected Net Returns (US$/Acre)	This Study	107.2	197.8	472.2	341.2	243.5	175.5	148.5	131.7	120.2	215.32	0.00
		USDA (2014)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		FAPRI (2013)	216.3	193.0	192.7	201.6	203.2	205.1	202.4	197.6	194.1	200.7	7.3

Note: 1) Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.
2) A 1 bale is equivalent to 480 lbs.

Table C-99 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average	% Diffe-rence
Oats	Planted Acres (Mil. Acres)	This Study	2.93	3.21	3.23	3.27	3.33	3.20	3.24	3.23	3.21	3.20	0.00
		USDA (2014)	3.00	2.80	2.70	2.50	2.50	2.50	2.50	2.50	2.50	2.61	22.70
		FAPRI (2013)	2.78	2.94	2.91	2.86	2.82	2.79	2.75	2.74	2.73	2.81	13.88
	Harvested Acres (Mil. Acres)	This Study	1.72	1.73	1.73	1.74	1.74	1.74	1.74	1.73	1.72	1.73	0.00
		USDA (2014)	1.00	1.10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	71.38
		FAPRI (2013)	1.08	1.20	1.20	1.18	1.16	1.15	1.13	1.13	1.13	1.15	50.54
	Yields (Bushels/Acre)	This Study	41.84	59.63	60.01	60.37	60.69	60.98	61.27	61.52	61.78	58.68	0.00
		USDA (2014)	64.00	64.10	64.40	64.70	65.00	65.30	65.60	65.90	66.20	65.02	-9.76
		FAPRI (2013)	63.40	63.80	64.30	64.80	65.40	65.80	66.30	66.80	67.30	65.32	-10.17
	Total Supply (Mil. Bushels)	This Study	242.9	248.0	249.0	250.1	250.8	251.2	251.4	251.4	251.3	249.56	0.00
		USDA (2014)	197.0	209.0	214.0	220.0	220.0	220.0	221.0	221.0	221.0	215.89	15.60
		FAPRI (2013)	212.0	219.0	224.0	225.0	224.0	225.0	225.0	226.0	227.0	223.00	11.91
	Total Demand (Mil. Bushels)	This Study	242.9	247.9	249.0	249.7	250.5	251.7	251.6	251.8	251.6	249.62	0.00
		USDA (2014)	197.0	209.0	214.0	220.0	220.0	220.0	221.0	221.0	222.0	216.00	15.57
		FAPRI (2013)	211.0	219.0	223.0	224.0	225.0	226.0	225.0	227.0	227.0	223.00	11.94
	Farm Price (US$/Bushel)	This Study	2.08	2.32	2.30	2.30	2.23	2.18	2.16	2.11	2.07	2.19	0.00
		USDA (2014)	3.50	2.35	1.95	1.95	2.00	2.10	2.20	2.25	2.30	2.29	-4.17
		FAPRI (2013)	2.95	2.93	2.94	2.97	2.96	2.95	2.92	2.89	2.89	2.93	-25.22
	Expected Net Returns (US$/Acre)	This Study	139.4	51.7	64.8	61.4	58.7	52.5	47.0	43.2	37.9	61.85	0.00
		USDA (2014)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		FAPRI (2013)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

Table C-99 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average	% Difference
LG and MSG Rice	Planted Acres (Mil. Acres)	This Study	2.48	3.42	3.59	3.58	3.56	3.59	3.63	3.62	3.61	3.45	0.00
		USDA (2014)	2.49	2.90	2.90	2.92	2.93	2.95	2.69	2.98	2.99	2.86	20.77
		FAPRI (2013)	2.76	2.90	2.86	2.85	2.84	2.80	2.77	2.75	2.72	2.81	23.07
	Harvested Acres (Mil. Acres)	This Study	2.30	3.18	3.34	3.31	3.29	3.31	3.36	3.35	3.35	3.20	0.00
		USDA (2014)	2.46	2.87	2.87	2.88	2.90	2.92	2.93	2.95	2.96	2.86	11.77
		FAPRI (2013)	2.72	2.86	2.82	2.81	2.80	2.76	2.73	2.71	2.68	2.77	15.69
	Yields (Cwt/Acre)	This Study	81.91	61.05	62.65	64.12	65.40	65.80	65.73	66.53	67.25	66.71	0.00
		USDA (2014)	73.11	73.48	73.84	74.21	74.58	74.96	75.33	75.71	76.09	74.59	-10.56
		FAPRI (2013)	73.35	74.11	74.88	75.56	76.18	76.71	77.30	77.96	78.59	76.07	-12.30
	Total Supply (Mil. Cwt)	This Study	252.7	261.0	277.3	281.9	285.4	288.2	290.6	292.7	294.7	280.50	0.00
		USDA (2014)	246.9	271.7	276.1	279.2	282.2	285.3	287.9	290.5	293.0	279.20	0.47
		FAPRI (2013)	249.7	258.5	259.6	262.2	264.1	263.8	264.1	264.6	265.0	261.29	7.35
	Total Demand (Mil. Cwt)	This Study	268.5	272.3	284.2	287.7	291.3	294.8	298.4	302.0	305.6	289.42	0.00
		USDA (2014)	246.9	251.7	276.2	279.2	282.2	285.3	287.9	290.5	293.0	276.99	4.49
		FAPRI (2013)	249.7	258.5	259.7	262.2	264.1	263.9	264.0	264.6	265.1	261.31	10.76
	Farm Price (US$/Cwt)	This Study	17.41	17.39	16.02	16.05	16.08	16.09	16.10	16.10	16.11	16.37	0.00
		USDA (2014)	15.70	15.30	15.60	15.70	15.80	15.90	16.00	16.00	16.10	15.79	3.70
		FAPRI (2013)	14.70	13.96	13.83	13.96	14.10	14.19	14.27	14.29	14.31	14.18	15.48
	Expected Net Returns (US$/Acre)	This Study	581.5	891.3	899.1	791.7	801.5	810.3	817.6	825.5	833.4	805.78	0.00
		USDA (2014)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		FAPRI (2013)	606.4	557.1	562.7	575.1	584.3	585.3	583.5	580.1	579.0	579.3	39.1

Note: 1) Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

2) As FAPRI (2013) does not provide individual forecast results for LG rice and MSG rice, the results in this study and USDA (2014) are adjusted for the comparison purpose only.

Table C-99 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average	% Difference
Sorghum	Planted Acres (Mil. Acres)	This Study	6.90	7.36	7.43	7.43	7.45	7.47	7.48	7.45	7.43	7.38	0.00
		USDA (2014)	8.10	6.50	6.20	6.00	5.80	5.80	5.80	5.80	5.80	6.20	18.99
		FAPRI (2013)	6.74	6.79	6.75	6.74	6.73	6.68	6.62	6.56	6.53	6.68	10.41
	Harvested Acres (Mil. Acres)	This Study	6.03	6.28	6.40	6.45	6.47	6.47	6.46	6.44	6.43	6.38	0.00
		USDA (2014)	6.70	5.50	5.20	5.00	4.90	4.90	4.90	4.90	4.90	5.21	22.42
		FAPRI (2013)	5.44	5.47	5.44	5.42	5.42	5.38	5.32	5.27	5.25	5.38	18.60
	Yields (Bushels/Acre)	This Study	66.13	65.85	65.79	65.85	65.95	66.06	66.18	66.29	66.41	66.06	0.00
		USDA (2014)	62.20	65.10	65.10	65.10	65.10	65.10	65.10	65.10	65.10	64.78	1.97
		FAPRI (2013)	63.40	63.80	64.30	64.80	65.40	65.80	66.30	66.80	67.30	65.32	1.12
	Total Supply (Mil. Bushels)	This Study	439.5	439.4	447.1	450.7	452.4	453.2	453.4	453.2	452.8	449.06	0.00
		USDA (2014)	431.0	389.0	378.0	364.0	353.0	352.0	351.0	350.0	349.0	368.56	21.84
		FAPRI (2013)	368.0	386.0	391.0	393.0	394.0	393.0	390.0	388.0	386.0	387.67	15.84
	Total Demand (Mil. Bushels)	This Study	439.5	439.4	447.1	450.7	452.5	453.2	453.4	453.2	452.8	449.07	0.00
		USDA (2014)	431.0	389.0	378.0	364.0	353.0	352.0	351.0	350.0	349.0	368.56	21.85
		FAPRI (2013)	368.0	385.0	392.0	393.0	394.0	393.0	390.0	388.0	386.0	387.67	15.84
	Farm Price (US$/Bushel)	This Study	4.42	4.91	4.65	4.73	4.60	4.57	4.48	4.42	4.34	4.57	0.00
		USDA (2014)	4.20	3.40	3.10	3.15	3.20	3.35	3.50	3.60	3.70	3.47	31.77
		FAPRI (2013)	4.56	4.64	4.70	4.73	4.70	4.65	4.58	4.50	4.47	4.61	-1.01
	Expected Net Returns (US$/Acre)	This Study	205.0	160.0	186.6	167.6	169.7	159.4	154.5	146.4	140.1	165.47	0.00
		USDA (2014)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		FAPRI (2013)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

Table C-99 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average	% Difference
Soybeans	Planted Acres (Mil. Acres)	This Study	77.16	79.16	79.68	80.70	81.56	82.53	83.42	84.33	85.21	81.53	0.00
		USDA (2014)	76.50	78.00	77.80	77.50	78.00	78.00	78.00	78.00	78.00	77.76	4.85
		FAPRI (2013)	78.50	76.40	77.20	77.30	77.20	77.50	77.60	77.40	77.40	77.39	5.35
	Harvested Acres (Mil. Acres)	This Study	75.90	77.90	78.44	79.47	80.32	81.28	82.17	83.07	83.94	80.28	0.00
		USDA (2014)	75.70	77.00	76.70	76.50	77.00	77.00	77.00	77.00	77.00	76.77	4.57
		FAPRI (2013)	77.40	75.40	76.10	76.20	76.20	76.40	76.60	76.40	76.40	76.34	5.15
	Yields (Bushels/Acre)	This Study	45.19	44.26	44.66	45.03	45.40	45.76	46.12	46.48	46.83	45.53	0.00
		USDA (2014)	43.00	45.20	45.60	46.10	46.50	46.90	47.40	47.80	48.30	46.31	-1.69
		FAPRI (2013)	43.50	44.10	44.60	45.10	45.60	46.00	46.50	47.00	47.50	45.54	-0.04
	Total Supply (Mil. Bushels)	This Study	3618.6	3705.9	3761.4	3836.5	3904.8	3977.6	4047.6	4118.9	4189.2	3906.73	0.00
		USDA (2014)	3413.0	3665.0	3718.0	1772.0	3840.0	3873.0	3905.0	3937.0	3974.0	3566.33	9.54
		FAPRI (2013)	3517.0	3527.0	3603.0	3652.0	3688.0	3727.0	3769.0	3801.0	3837.0	3680.11	6.16
	Total Demand (Mil. Bushels)	This Study	3618.7	3705.9	3761.4	3836.6	3904.9	3977.4	4047.6	4118.8	4189.3	3906.73	0.00
		USDA (2014)	3413.0	3664.0	3718.0	3702.0	3804.0	3873.0	3905.0	3937.0	3937.0	3772.56	3.56
		FAPRI (2013)	3517.0	3527.0	3604.0	3653.0	3688.0	3728.0	3769.0	3800.0	3837.0	3680.33	6.15
	Farm Price (US$/Bushel)	This Study	14.63	14.77	15.41	15.32	15.29	15.07	14.87	14.62	14.37	14.93	0.00
		USDA (2014)	12.15	9.75	8.85	8.89	9.05	9.25	9.45	9.60	9.75	9.64	54.89
		FAPRI (2013)	11.49	11.25	10.98	11.22	11.47	11.67	11.65	11.69	11.69	11.46	30.30
	Expected Net Returns (US$/Acre)	This Study	437.4	530.8	540.6	571.9	570.9	572.4	565.0	558.3	549.2	544.04	0.00
		USDA (2014)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		FAPRI (2013)	360.1	357.1	350.5	364.1	378.9	388.4	390.1	394.0	395.9	375.4	44.9

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

Table C-99 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average	% Diffe-rence
Soybean Meal	Total Supply (Mil. Short Tons)	This Study	45.04	45.80	46.39	47.19	47.98	48.83	49.67	50.53	51.39	48.09	0.00
		USDA (2014)	40.50	40.90	41.35	41.70	42.15	42.70	43.25	43.83	44.35	42.30	13.68
		FAPRI (2013)	41.34	41.07	42.22	42.76	43.26	43.74	44.22	44.69	45.23	43.17	11.40
	Total Demand (Mil. Short Tons)	This Study	45.04	45.79	46.39	47.19	47.98	48.82	49.67	50.53	51.39	48.09	0.00
		USDA (2014)	40.50	40.90	41.35	41.70	42.15	42.70	43.25	43.83	44.35	42.30	13.68
		FAPRI (2013)	41.34	41.61	42.22	42.77	43.26	43.74	44.22	44.79	45.23	43.24	11.21
	Farm Price (US$/Short Ton)	This Study	495.1	494.4	505.0	501.1	498.2	491.3	484.5	476.5	468.4	490.50	0.00
		USDA (2014)	395.0	310.0	277.5	277.5	283.5	291.5	299.0	305.0	311.0	305.56	60.53
		FAPRI (2013)	280.0	286.2	295.0	300.6	305.3	307.1	307.2	308.4	310.6	300.04	63.48
Soybean Oil	Total Supply (Bil. lbs)	This Study	27.19	27.38	27.72	28.18	28.63	29.11	29.59	30.09	30.58	28.72	0.00
		USDA (2014)	21.34	21.42	21.96	22.34	22.64	22.90	23.12	23.40	23.73	22.54	27.43
		FAPRI (2013)	21.42	21.62	22.01	22.37	22.64	22.85	23.11	23.39	23.70	22.57	27.26
	Total Demand (Bil. lbs)	This Study	27.19	27.38	27.72	28.18	28.63	29.11	29.59	30.09	30.58	28.72	0.00
		USDA (2014)	21.34	21.42	21.96	22.34	22.64	22.90	23.12	23.40	23.73	22.54	27.43
		FAPRI (2013)	21.42	21.62	22.01	22.37	22.64	22.85	23.11	23.39	23.70	22.57	27.26
	Farm Price (US$/lb)	This Study	0.42	0.44	0.46	0.47	0.48	0.49	0.50	0.52	0.53	0.48	0.00
		USDA (2014)	0.42	0.37	0.35	0.36	0.36	0.36	0.37	0.37	0.37	0.37	29.64
		FAPRI (2013)	0.58	0.56	0.55	0.55	0.55	0.54	0.54	0.53	0.53	0.55	-12.46

Note: 1) Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.
2) A 1 short ton equals 2,000 lbs.

Table C-99 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average	% Diffe-rence
Wheat	Planted Acres (Mil. Acres)	This Study	56.53	57.60	57.51	57.22	56.68	56.06	55.57	55.20	54.82	56.35	0.00
		USDA (2014)	56.20	57.00	56.00	54.00	52.00	52.00	52.00	52.00	52.00	53.69	4.96
		FAPRI (2013)	57.50	56.10	54.60	53.70	53.60	53.70	53.80	53.90	53.60	54.50	3.40
	Harvested Acres (Mil. Acres)	This Study	47.89	49.55	49.44	49.18	48.68	48.12	47.68	47.35	47.00	48.32	0.00
		USDA (2014)	45.20	48.50	47.70	46.00	44.30	44.30	44.30	44.30	44.30	45.43	6.35
		FAPRI (2013)	49.70	48.50	47.10	46.30	46.30	46.40	46.50	46.50	46.30	47.07	2.66
	Yields (Bushels/Acre)	This Study	45.91	46.43	46.76	47.12	47.50	47.90	48.31	48.73	49.16	47.54	0.00
		USDA (2014)	47.10	45.80	46.20	46.60	47.00	47.40	47.80	48.20	48.60	47.19	0.74
		FAPRI (2013)	44.90	45.90	46.30	46.80	47.20	47.50	47.90	48.30	48.60	47.04	1.04
	Total Supply (Mil. Bushels)	This Study	3021.5	3242.9	3232.4	3258.2	3262.7	3243.3	3242.3	3247.1	3250.1	3222.28	0.00
		USDA (2014)	2998.0	2925.0	2997.0	3050.0	3044.0	3050.0	3063.0	3078.0	3095.0	3033.33	6.23
		FAPRI (2013)	3070.0	3070.0	3067.0	3061.0	3076.0	3090.0	3106.0	3125.0	3133.0	3088.67	4.33
	Total Demand (Mil. Bushels)	This Study	3021.5	3242.9	3232.4	3258.1	3262.7	3243.3	3242.3	3247.1	3250.1	3222.28	0.00
		USDA (2014)	2998.0	2945.0	2997.0	3050.0	3044.0	3050.0	3063.0	3078.0	3095.0	3035.56	6.15
		FAPRI (2013)	3070.0	3071.0	3068.0	3062.0	3076.0	3090.0	3106.0	3125.0	3133.0	3089.00	4.31
	Farm Price (US$/Bushel)	This Study	8.44	6.83	6.51	6.28	6.05	6.06	6.03	5.94	5.82	6.44	0.00
		USDA (2014)	7.00	4.90	7.35	4.30	4.45	4.60	4.75	4.90	5.05	5.26	22.53
		FAPRI (2013)	5.63	5.81	6.01	6.15	6.15	6.12	6.10	6.00	5.95	5.99	7.48
	Expected Net Returns (US$/Acre)	This Study	234.0	295.0	222.7	208.1	197.9	187.6	188.2	186.9	182.8	211.47	0.00
		USDA (2014)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		FAPRI (2013)	206.1	171.3	164.3	167.8	172.6	178.9	181.3	179.9	178.1	177.8	18.9

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

Table C-99 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Average	% Diffe-rence
Peanuts	Planted Acres (Mil. Acres)	This Study	1.14	1.13	1.12	1.10	1.09	1.08	1.07	1.06	1.04	1.09	0.00
		FAPRI (2013)	1.40	1.32	1.43	1.42	1.43	1.41	1.41	1.41	1.40	1.40	-22.19
	Harvested Acres (Mil. Acres)	This Study	1.07	1.02	1.01	1.00	0.99	0.98	0.96	0.95	0.94	0.99	0.00
		FAPRI (2013)	1.35	1.27	1.38	1.37	1.38	1.36	1.36	1.36	1.35	1.35	-26.81
	Yields (Pounds/Acre)	This Study	3240.73	3267.25	3293.78	3320.30	3346.83	3373.35	3399.88	3426.41	3452.93	3346.83	0.00
		FAPRI (2013)	3498.00	3543.00	3589.00	3642.00	3692.00	3742.00	3795.00	3846.00	3893.00	3693.33	-9.38
	Total Supply (Mil. Pounds)	This Study	5172.36	5032.95	5048.73	4970.90	4878.99	4838.08	4913.47	4888.49	4846.28	4954.47	0.00
		FAPRI (2013)	4811.00	4590.00	5045.00	5070.00	5165.00	5169.00	5223.00	5290.00	5340.00	5078.11	-2.43
	Total Demand (Mil. Pounds)	This Study	5172.36	5032.95	5048.73	4970.90	4878.99	4838.08	4913.47	4888.49	4846.28	4954.47	0.00
		FAPRI (2013)	5066.0	4941.0	5016.0	5059.0	5133.0	5167.0	5206.0	5263.0	5315.0	5129.56	-3.41
	Farm Price (US$/lb)	This Study	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.32	0.00
		FAPRI (2013)	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.25	27.45
	Expected Net Returns (US$/Acre)	This Study	841.7	638.0	768.7	658.2	639.8	663.6	721.2	636.6	609.6	686.38	0.00
		FAPRI (2013)	314.4	378.3	392.3	407.3	404.4	419.0	420.6	421.4	423.3	397.88	72.51

Note: 1) Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.
2) A 1ton equals 2204.622 lbs.

Table C-100. Producer and Consumer Surplus Changes under the Exchange Rate Changes, 2013-2022 Average

Exchange Rate	Depreciation by 10%		Appreciation by 10%	
Crop	Producer Surplus Changes (Mil. $)	Consumer Surplus Changes (Mil. $)	Producer Surplus Changes (Mil. $)	Consumer Surplus Changes (Mil. $)
Barley	70.00	-67.73	-70.07	69.11
Corn	3,367.06	-2,886.20	-3,444.77	2,975.34
Cotton	657.82	-73.96	-597.39	79.88
Oats	10.99	-21.63	-11.12	21.99
LG Rice	53.71	-32.69	-23.37	14.46
MSG Rice	58.64	-35.67	-3.79	2.28
Sorghum	95.60	-56.10	-99.17	58.81
Soybeans	6,431.32	-3,634.56	-6,176.09	3,546.56
Soybean Meal	3,257.02	-2,575.67	-3,423.57	2,734.57
Soybean Oil	296.12	-274.34	-237.62	220.40
Wheat	2,018.98	-1,184.45	-1,806.45	1,096.42
Peanuts	59.37	-57.24	-60.18	58.57
Total	16,376.61	-10,900.22	-15,953.61	10,878.37

Table C-101. Producer and Consumer Surplus Changes under the RFS2, 2013-2022 Average

Crop	Producer Surplus Changes (Mil. $)	Consumer Surplus Changes (Mil. $)
Barley	97.08	-95.97
Corn	10,979.77	-9,504.16
Cotton	369.48	-36.08
Oats	21.25	-42.42
LG Rice	79.30	-48.53
MSG Rice	58.87	-36.05
Sorghum	286.59	-179.25
Soybeans	6,316.66	-3,583.21
Soybean Meal	1,544.32	-1,229.71
Soybean Oil	697.22	-647.77
Wheat	1,507.04	-908.52
Peanuts	1.49	-1.48
Total	21,959.09	-16,313.15

Table C-102. Definition of Terms in PLC Provisions

Term(s)	Definition of Term(s)
Covered Commodity	Wheat, oats, barley, corn, grain sorghum, long grain rice, medium grain rice, pulse crops, soybeans, other oil seeds, and peanuts.
Effective Price	The price calculated to determine whether price loss coverage payments are required to be provided for a crop year.
Payment Acres	85 percent of base acres planted for the year to each covered commodity on a farm
Reference Price	(1) Wheat, $ 5.50 per bushel. (2) Corn, $3.70 per bushel. (3) Grain Sorghum, $3.95 per bushel. (4) Barley, $4.95 per bushel. (5) Oats, $2.40 per bushel. (6) Long Grain Rice, $14.00 per hendred weight. (7) Medium Grain Rice, $14.00 per hendred weight. (8) Soybeans, $8.40 per bushel. (9) Peanuts, $535.00 per ton.

Source: Chite (2014)

Table C-103. Definition of Terms in ARC Provisions

Term(s)	Definition of Term(s)
Farm-level Option	(1) Benchmark Revenue = Olympic average of 5-year farm yield * Olympic average of 5-year average national price (2) Payment Rates = (Per acre guarantee – per acre actual revenue) * (0.65 * base acres)
County-level Option	(1) Benchmark Revenue = Olympic average of 5-year county yield * Olympic average of 5-year average national price (2) Payment Rates = (Per acre guarantee – per acre actual revenue) * (0.85 * base acres)

Table C-104. Number of 'Eligible' Counties by Cover Commodity

Crop	Number of Counties	Region								
		CB	CP	DS	FW	LS	NE	NP	SE	SP
Barley	Number of Eligible Counties				0			8		
	Number of Total Counties				0			150		
Corn	Number of Eligible Counties	63	18	8	0	23	22	8	27	11
	Number of Total Counties	484	228	120	106	169	227	152	574	194
Oats	Number of Eligible Counties				0	35		15		5
	Number of Total Counties				151	210		192		180
Rice	Number of Eligible Counties				7	0				
	Number of Total Counties				15	0				
Sorghum	Number of Eligible Counties		39							24
	Number of Total Counties		229							297
Soybeans	Number of Eligible Counties	60	15	14		21	7	13	29	
	Number of Total Counties	475	183	132		202	135	104	488	
Wheat	Number of Eligible Counties	49	34	10	13	21	11	16	45	32
	Number of Total Counties	380	232	110	140	139	118	179	458	276
Peanuts	Number of Eligible Counties								15	
	Number of Total Counties								180	

Note: 1) At the county level data, long grain and medium/short grain rice are not distinguished.
2) Shaded cells denotes the regions of interest in this study.

Table C-105. Descriptive Statistics for the 'Eligible' Counties' Planted Acres and Yields

Crop	Region	County Code (FIPS)	Planted acres: 2002-2012 Average	Planted acres: Standard Deviation	Yields: 2002-2012 Average	Yields: Standard Deviation
Barley	Northern Plains	30009	9,720.0	1,086.1	95.6	10.0
		30041	18,610.0	5,647.1	43.7	10.1
		30097	2,433.3	911.0	45.5	7.9
		30107	12,133.3	3,023.7	29.6	9.6
		38011	18,636.4	6,916.4	42.8	12.6
		38065	11,572.7	5,002.6	50.7	12.7
		38101	61,740.0	20,776.3	61.2	5.4
Oats	Lake States	26035	970.0	283.0	61.1	8.7
		26063	1,900.0	637.2	89.7	4.7
		26129	2,050.0	307.4	63.3	7.6
		26141	2,954.5	124.5	57.5	8.8
		27015	2,340.0	694.8	80.8	6.3
		27093	2,660.0	855.3	51.9	14.1
		27115	3,400.0	1,004.0	64.1	7.3
		27163	1,250.0	395.1	52.1	5.1
		55017	8,781.8	2,362.1	64.3	7.0
		55053	5,880.0	1,141.9	57.0	7.8
		55093	8,462.5	1,448.1	59.6	6.3
		55131	3,518.2	929.3	71.3	7.6
Rice	Delta States	5003	13,400.0	4,126.7	64.1	19.4
		5031	80,340.0	6,144.0	68.5	4.2
		5075	99,536.4	5,546.6	65.6	3.8
		5111	125,270.0	8,295.3	69.0	3.3
		22053	78,072.7	3,982.2	59.9	4.6
		22113	60,472.7	1,388.1	55.7	5.2
		22097	24,380.0	3,097.6	57.9	3.5
		28083	15,900.0	5,820.0	68.6	3.3
		28133	33,772.7	9,734.0	67.6	2.6
		28143	23,781.8	2,857.6	68.7	5.1

Note: Average yields are expressed in units per acre (Bushels for barley, corn, oats, sorghum, soybean, and wheat; cwt for rice; pounds for peanuts).

Table C-105 (Continued)

Crop	Region	County Code (FIPS)	Planted acres 2002-2012 Average	Planted acres Standard Deviation	Yields 2002-2012 Average	Yields Standard Deviation
Corn	Corn Belt	19015	158,318.2	12,446.4	172.0	13.3
		19093	122,354.5	7,384.6	179.5	17.6
		19143	120,200.0	6,169.8	173.6	14.3
		17087	7,390.0	1,242.3	126.2	23.2
		17029	123,000.0	4,968.7	155.6	27.8
		17199	15,809.1	3,638.8	152.8	41.1
		18023	126,800.0	36,730.1	171.7	11.5
		18095	86,622.2	5,448.8	154.1	21.2
		18171	93,090.0	3,882.6	161.1	20.1
		29171	12,818.2	2,620.2	112.7	27.6
		29057	12,636.4	2,825.0	111.3	26.9
		29195	134,700.0	6,595.5	143.5	28.6
		39015	22,609.1	4,208.9	133.9	23.2
		39091	67,790.0	6,464.0	156.3	14.4
		39159	56,100.0	12,192.5	149.1	34.7
	Central Plains	20015	51,572.7	12,536.5	80.8	28.2
		20037	41,977.8	7,756.9	90.6	26.4
		20113	29,481.8	8,533.2	140.6	28.6
		20177	33,100.0	3,460.1	110.1	25.6
		20205	31,410.0	11,228.2	91.6	27.8
		31001	173,427.3	10,393.2	184.5	6.7
		31063	84,600.0	15,543.2	129.4	13.1
		31095	91,254.5	10,568.8	148.0	15.8
		31121	130,427.3	6,533.3	166.5	11.1
		31179	119,340.0	9,894.5	144.8	34.1
	Lake States	26015	43,045.5	3,394.5	135.1	14.3
		26049	29,636.4	2,802.6	125.3	10.0
		26107	21,981.8	3,023.2	117.5	17.9
		26121	18,433.3	1,438.7	119.2	21.1
		27013	204,227.3	51,207.5	169.5	7.5
		27041	59,060.0	6,411.7	136.3	19.6
		27093	118,700.0	6,593.5	155.1	17.3
		27127	237,890.0	5,902.3	168.5	13.5
		55011	66,009.1	4,937.5	144.6	11.1
		55057	39,963.6	2,637.9	131.7	19.4
		55091	28,980.0	1,914.2	146.5	12.2
		55135	62,290.0	4,187.1	129.5	9.0

Note: Average yields are expressed in units per acre (Bushels for barley, corn, oats, sorghum, soybean, and wheat; cwt for rice; pounds for peanuts).

Table C-105 (Continued)

Crop	Region	County Code (FIPS)	Planted acres 2002-2012 Average	Planted acres Standard Deviation	Yields 2002-2012 Average	Yields Standard Deviation
Sorghum	Central Plains	20015	30,644.4	17,059.7	58.7	24.9
		20073	2,300.0	939.4	36.4	20.9
		20089	57,800.0	9,609.5	88.1	25.1
		20099	10,470.0	8,553.2	67.2	18.2
		20145	50,100.0	4,700.6	67.2	26.4
		31029	4,825.0	1,484.9	54.3	19.8
		31059	9,181.8	6,090.6	79.2	18.4
		31083	8,427.3	5,747.0	76.7	24.1
		31095	17,050.0	1,582.0	87.3	17.9
		31109	4,750.0	2,816.3	87.4	16.0
	Southern Plains	48025	19,381.8	4,861.4	55.2	14.0
		48027	16,000.0	2,838.3	63.7	11.8
		48029	6,981.8	2,011.4	33.3	13.7
		48061	103,209.1	10,732.8	62.1	11.4
		48099	4,987.5	1,000.6	45.7	18.6
		48139	18,027.3	4,294.0	66.4	13.5
		48153	42,160.0	31,619.0	64.2	10.3
		48193	2,963.6	883.5	53.1	8.5
		48295	5,730.0	2,872.9	54.8	16.7
		48369	40,018.2	18,127.4	62.3	16.5
Peanuts	South East	1053	12,645.5	4,746.4	3,554.0	711.7
		1067	20,536.4	2,812.6	2,486.0	752.6
		12033	6,900.0	2,208.1	3,539.2	591.4
		12059	5,118.2	1,473.6	2,667.0	471.3
		12079	6,125.0	3,498.1	3,019.6	709.3
		13007	16,818.2	2,249.4	4,307.1	783.4
		13033	18,859.1	7,271.9	3,266.3	628.1
		13037	15,454.5	1,463.8	4,003.7	957.2
		13075	9,581.8	2,234.6	3,258.1	399.5
		13093	16,763.6	4,441.0	2,971.0	667.6
		37065	8,337.7	2,786.8	2,922.0	716.9
		37073	4,550.5	1,806.4	3,843.9	506.4

Note: Average yields are expressed in units per acre (Bushels for barley, corn, oats, sorghum, soybean, and wheat; cwt for rice; pounds for peanuts).

Table C-105 (Continued)

Crop	Region	County Code (FIPS)	Planted acres 2002-2012 Average	Planted acres Standard Deviation	Yields 2002-2012 Average	Yields Standard Deviation
Soybeans	Corn Belt	19051	42,560.0	4,332.6	40.7	7.6
		19137	88,380.0	2,654.1	45.8	7.5
		19197	140,636.4	11,428.2	49.0	3.8
		17027	115,900.0	30,668.3	38.2	8.3
		17081	85,909.1	6,106.6	33.1	7.7
		17125	80,545.5	10,053.5	43.9	5.0
		18003	103,709.1	5,975.2	46.4	5.8
		18065	82,081.8	3,815.2	48.1	5.4
		18169	84,854.5	4,369.3	46.8	5.0
		29031	59,290.0	4,914.5	39.3	6.1
		29141	9,245.5	1,386.6	33.5	10.5
		29207	163,081.8	17,431.4	40.9	3.8
		39023	67,830.0	3,965.1	47.0	6.5
		39071	93,254.5	3,539.6	40.8	6.2
		39143	84,718.2	3,365.4	42.9	6.1
	Central Plains	20015	51,345.5	14,828.0	27.2	11.8
		20113	53,581.8	23,755.2	33.2	6.5
		20049	11,190.9	2,563.0	25.8	7.7
		20131	92,872.7	13,696.6	36.6	12.3
		20121	44,190.9	4,597.9	29.2	10.0
		31015	15,645.5	4,594.0	31.4	12.4
		31043	50,236.4	3,345.8	43.0	8.1
		31093	31,272.7	5,591.3	51.1	6.8
		31095	82,380.0	6,177.5	44.4	6.9
		31181	42,600.0	11,864.0	46.9	7.4
	Lake States	26017	39,400.0	3,314.5	43.4	4.8
		26025	71,063.6	3,558.7	38.1	6.5
		26077	33,009.1	3,643.2	39.9	8.3
		26161	45,609.1	1,628.2	36.2	6.5
		27053	14,972.7	879.9	40.0	6.9
		27067	111,010.0	9,499.4	42.4	5.5
		27127	212,036.4	7,689.4	44.3	6.4
		27163	4,018.2	3,073.8	38.2	5.9
		55079	1,636.4	544.6	34.0	7.5
		55097	12,100.0	1,319.9	37.1	5.3
		55117	25,218.2	1,777.5	41.1	9.0
		55133	20,580.0	2,043.3	37.9	8.1

Note: Average yields are expressed in units per acre (Bushels for barley, corn, oats, sorghum, soybean, and wheat; cwt for rice; pounds for peanuts).

Table C-105 (Continued)

Crop	Region	County Code (FIPS)	Planted acres 2002-2012 Average	Planted acres Standard Deviation	Yields 2002-2012 Average	Yields Standard Deviation
Wheat	Central Plains	20023	138,036.4	13,457.5	40.2	16.0
		20055	170,372.7	9,610.2	37.8	9.4
		20099	52,890.9	26,017.6	35.7	14.5
		20143	117,681.8	5,302.6	42.4	9.9
		20193	192,100.0	21,309.2	38.0	10.9
		31015	4,390.0	2,616.0	45.2	10.1
		31061	19,209.1	4,420.3	44.4	5.3
		31087	71,860.0	8,944.3	41.9	12.6
		31131	5,272.7	1,421.3	47.0	7.4
		31161	51,050.0	4,672.2	39.5	6.3
	Northern Plains	30013	113,372.7	7,342.5	43.5	7.3
		30067	5,100.0	544.1	33.8	6.5
		30111	77,563.6	27,441.1	29.2	5.4
		38047	8,170.0	5,201.1	39.6	9.8
		38051	11,760.0	6,460.7	47.3	8.4
		38053	5,166.7	4,962.9	34.0	11.9
		46023	59,290.0	19,550.9	55.9	5.8
		46107	64,910.0	8,447.0	47.3	12.5
		46129	8,700.0	4,261.5	45.1	13.8
		56021	83,145.5	9,424.9	29.0	6.2
	Southern Plains	35059	27,500.0	3,684.1	53.2	6.5
		40003	244,545.5	17,386.0	35.0	10.3
		40065	209,545.5	9,862.7	29.9	6.1
		48011	59,154.5	4,880.0	23.6	9.6
		48069	164,500.0	14,623.0	44.3	5.5
		48095	50,827.3	7,927.2	22.7	4.8
		48117	210,290.0	23,530.8	28.2	7.2
		48147	48,009.1	17,440.1	37.0	6.3
		48163	10,136.4	1,829.9	32.4	10.7
		48309	36,827.3	8,545.7	41.6	8.0

Note: Average yields are expressed in units per acre (Bushels for barley, corn, oats, sorghum, soybean, and wheat; cwt for rice; pounds for peanuts).

Table C-106. Producer and Consumer Surplus Changes under the 2014 Farm Bill, 2013-2022 Average

2014 Farm Bill	The House Bill		The Senate Bill		The 2014 Farm Bill	
Crop	Producer Surplus Changes (Mil. $)	Consumer Surplus Changes (Mil. $)	Producer Surplus Changes (Mil. $)	Consumer Surplus Changes (Mil. $)	Producer Surplus Changes (Mil. $)	Consumer Surplus Changes (Mil. $)
Barley	-0.58	0.57	0.12	-0.11	0.21	-0.11
Corn	209.65	-179.56	185.93	-159.44	218.83	-187.51
Cotton	48.59	-4.16	54.37	-4.85	52.67	-5.06
Oats	-0.29	0.55	0.01	-0.01	-0.08	0.16
LG Rice	69.40	-43.02	69.40	-43.02	69.27	-42.94
MSG Rice	4.86	-3.02	4.82	-2.99	4.75	-2.95
Sorghum	9.93	-5.89	8.96	-5.29	10.18	-6.03
Soybeans	-512.46	291.90	-492.25	280.31	-461.22	262.67
Soybean Meal	-138.75	110.20	-133.44	105.99	-125.04	99.31
Soybean Oil	-49.98	46.39	-48.11	44.67	-45.04	41.82
Wheat	166.43	-100.38	153.57	-92.68	153.90	-92.96
Peanuts	-0.45	0.44	-0.43	0.42	-0.35	0.34
Total	-193.64	114.04	-197.04	123.00	-121.92	66.74

Table C-107. Comparison of the Estimated Government Expenditure Changes under the 2014 Farm Bill by This Study and CBO

Program	The House Bill (Mil. $)						The Senate Bill (Mil. $)						2014 Farm Bill (Mil. $)		
	This Study			CBO (2014)			This Study			CBO (2014)			This Study		
Year	Budget Reduction by Repealing DP and CCP	Budget Increment by PLC	Net Budget Reduction	Budget Reduction by Repealing DP and CCP	Budget Increment by PLC	Net Budget Reduction	Budget Reduction by Repealing DP and CCP	Budget Increment by ARC and AMP	Net Budget Reduction	Budget Reduction by Repealing DP and CCP	Budget Increment by ARC and AMP	Net Budget Reduction	Budget Reduction by Repealing DP and CCP	Budget Increment by PLC and ARC	Net Budget Reduction
2015	4,915	86	4,828	4,538	0	4,538	4,913	200	4,714	4,538	0	4,538	4,915	42	4,873
2016	4,926	66	4,860	4,655	1,652	3,003	4,927	31	4,896	4,655	2,115	2,540	4,926	18	4,908
2017	4,955	61	4,894	4,720	1,755	2,965	4,954	31	4,923	4,720	2,327	2,393	4,954	14	4,940
2018	4,968	51	4,916	4,728	1,708	3,020	4,968	0	4,968	4,728	2,086	2,642	4,968	17	4,951
2019	4,993	43	4,950	4,753	1,633	3,120	4,992	0	4,992	4,753	1,628	3,125	4,993	18	4,975
2020	5,007	33	4,974	4,755	1,622	3,133	5,007	0	5,007	4,755	1,396	3,359	5,008	21	4,987
2021	5,024	25	5,000	4,745	1,585	3,160	5,024	0	5,024	4,745	1,557	3,188	5,025	24	5,001
2022	5,039	21	5,018	4,735	1,589	3,146	5,039	0	5,039	4,735	1,416	3,319	5040	23	5,017
Average	4,978	48	4,930	4,704	1,443	3,261	4,978	33	4,945	4,704	1,566	3,138	4,979	22	4,957

Table C-108. Comparison of the 2014 Farm Bill Forecast Results by FAPRI and This Study

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Average	% Difference
Corn	Planted Acres (Mil. Acres)	This Study	97.38	87.79	89.61	89.39	90.51	90.92	91.77	92.38	93.13	93.79	91.67	0.00
		FAPRI (2014)	95.40	91.30	90.60	91.10	91.00	91.30	91.20	90.80	90.50	90.10	91.33	0.37
	Harvested Acres (Mil. Acres)	This Study	89.03	79.95	81.69	81.47	82.53	82.91	83.71	84.28	84.99	85.61	83.62	0.00
		FAPRI (2014)	87.70	83.40	82.80	83.20	83.10	83.30	83.30	82.90	82.60	82.10	83.44	0.21
	Yields (Bushels/Acre)	This Study	140.87	160.30	161.99	163.57	165.22	166.84	168.47	170.10	171.73	173.36	164.25	0.00
		FAPRI (2014)	158.80	163.50	165.60	167.80	169.80	171.70	173.70	175.80	177.60	179.40	170.37	-3.59
	Total Supply (Mil. Bushels)	This Study	13981.2	13721.8	14138.5	14231.8	14542.0	14737.7	15008.4	15242.1	15502.0	15747.9	14685.34	0.00
		FAPRI (2014)	14781.0	15338.0	15577.0	15884.0	16095.0	16324.0	16518.0	16667.0	16817.0	16949.0	16095.00	-8.76
	Total Demand (Mil. Bushels)	This Study	13981.2	13721.8	14138.5	14231.8	14542.0	14737.7	15008.4	15242.1	15502.0	15747.9	14685.34	0.00
		FAPRI (2014)	14781.0	15338.0	15577.0	15884.0	16094.0	16324.0	16518.0	16667.0	16817.0	17106.0	16110.60	-8.85
	Farm Price (US$/Bushel)	This Study	4.27	4.81	4.54	4.72	4.59	4.62	4.55	4.52	4.47	4.57	4.57	0.00
		FAPRI (2014)	4.42	4.17	4.09	4.07	4.06	4.04	4.02	3.97	3.93	3.92	4.07	12.19
	Expected Net Returns (US$/Acre)	This Study	615.4	405.1	493.4	451.2	480.8	461.3	466.3	455.5	452.6	443.4	472.50	0.00
		FAPRI (2014)	413.2	398.5	407.5	412.3	407.8	405.9	408.3	404.9	396.6	397.3	405.24	16.60
Barley	Planted Acres (Mil. Acres)	This Study	3.46	3.34	3.27	3.22	3.17	3.13	3.09	3.06	3.03	3.01	3.18	0.00
		FAPRI (2014)	3.48	3.57	3.41	3.44	3.41	3.39	3.37	3.34	3.34	3.32	3.41	-6.74
	Harvested Acres (Mil. Acres)	This Study	3.03	2.92	2.86	2.81	2.76	2.73	2.70	2.67	2.64	2.62	2.77	0.00
		FAPRI (2014)	3.00	3.10	2.96	2.99	2.96	2.94	2.93	2.90	2.90	2.88	2.96	-6.20
	Yields (Bushels/Acre)	This Study	62.87	70.20	71.30	72.11	72.90	73.74	74.51	75.28	76.04	76.76	72.57	0.00
		FAPRI (2014)	71.70	71.30	72.10	72.60	73.30	73.90	74.40	75.00	75.60	76.20	73.61	-1.41
	Total Supply (Mil. Bushels)	This Study	284.8	274.7	273.7	272.3	271.5	271.2	270.9	270.8	270.9	271.2	273.19	0.00
		FAPRI (2014)	320.0	332.0	330.0	336.0	339.0	337.0	338.0	339.0	340.0	341.0	335.20	-18.50
	Total Demand (Mil. Bushels)	This Study	284.8	274.8	273.7	272.3	271.0	271.0	270.7	270.7	270.8	271.2	273.09	0.00
		FAPRI (2014)	320.0	332.0	330.0	336.0	337.0	337.0	339.0	339.0	340.0	341.0	335.10	-18.51
	Farm Price (US$/Bushel)	This Study	4.31	5.35	5.39	5.63	5.74	5.89	6.02	6.16	6.29	6.51	5.73	0.00
		FAPRI (2014)	6.00	4.64	4.59	4.52	4.48	4.48	4.46	4.46	4.43	4.43	4.65	23.22
	Expected Net Returns (US$/Acre)	This Study	236.8	155.0	215.5	219.4	234.4	242.4	252.8	261.8	271.7	281.2	237.10	0.00
		FAPRI (2014)	243.3	188.3	197.1	198.5	195.5	254.3	192.3	194.0	189.5	190.2	204.29	16.06

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

Table C-108 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Average	% Difference
Cotton	Planted Acres (Mil. Acres)	This Study	9.73	10.61	11.37	11.69	11.80	11.81	11.76	11.68	11.59	11.50	11.35	0.00
		FAPRI (2014)	10.21	10.46	10.69	10.70	10.57	10.57	10.57	10.49	10.37	10.36	10.50	8.14
	Harvested Acres (Mil. Acres)	This Study	9.04	9.63	10.17	10.50	10.67	10.73	10.72	10.66	10.60	10.52	10.32	0.00
		FAPRI (2014)	7.47	8.74	8.95	8.97	8.85	8.85	8.86	8.79	8.68	8.67	8.68	18.90
	Yields (Pounds/Acre)	This Study	805.80	718.71	742.39	760.53	773.45	783.22	790.30	796.21	801.44	806.44	777.85	0.00
		FAPRI (2014)	807.00	794.00	801.00	809.00	817.00	825.00	833.00	841.00	847.00	855.00	822.90	-5.47
	Total Supply (Mil. lbs)	This Study	9712.2	8400.0	9034.1	9468.1	9733.7	9885.0	9949.0	9971.7	9973.0	9968.0	9609.50	0.00
		FAPRI (2014)	7804.8	8356.8	8894.4	9091.2	9163.2	9264.0	9345.6	9422.4	9417.6	9456.0	9021.60	6.52
	Total Demand (Mil. lbs)	This Study	9712.2	8400.0	9034.1	9468.1	9733.7	9885.0	9949.0	9971.7	9973.1	9968.0	9609.50	0.00
		FAPRI (2014)	7977.6	8404.8	8750.4	9091.2	9163.2	9264.0	9350.4	9350.4	9412.8	9456.0	9022.08	6.51
	Farm Price (US$/lb)	This Study	0.88	1.25	1.05	0.92	0.83	0.78	0.75	0.73	0.72	0.71	0.86	0.00
		FAPRI (2014)	0.74	0.67	0.66	0.66	0.66	0.66	0.66	0.66	0.67	0.67	0.67	28.40
	Expected Net Returns (US$/Acre)	This Study	42.6	164.1	440.8	309.4	211.5	144.7	99.5	72.2	53.2	38.8	157.69	0.00
		FAPRI (2014)	302.6	210.7	192.3	184.4	184.0	180.2	181.2	175.7	161.3	219.5	157.88	-0.12
Oats	Planted Acres (Mil. Acres)	This Study	2.93	3.23	3.25	3.30	3.36	3.24	3.29	3.29	3.29	3.28	3.25	0.00
		FAPRI (2014)	3.01	2.99	3.09	3.05	2.98	2.97	2.95	2.92	2.90	2.89	2.98	9.14
	Harvested Acres (Mil. Acres)	This Study	1.72	1.74	1.75	1.76	1.76	1.76	1.76	1.76	1.76	1.75	1.75	0.00
		FAPRI (2014)	1.03	1.17	1.21	1.19	1.17	1.16	1.15	1.14	1.14	1.13	1.15	52.45
	Yields (Bushels/Acre)	This Study	41.84	59.68	60.04	60.38	60.72	61.01	61.28	61.55	61.81	62.05	59.04	0.00
		FAPRI (2014)	64.00	64.40	65.10	65.60	66.20	66.70	67.30	67.90	68.30	68.90	66.44	-11.15
	Total Supply (Mil. Bushels)	This Study	242.9	248.7	249.8	251.1	251.9	252.6	253.0	253.3	253.5	253.6	251.04	0.00
		FAPRI (2014)	192.0	205.0	214.0	218.0	219.0	218.0	219.0	218.0	218.0	220.0	214.10	17.26
	Total Demand (Mil. Bushels)	This Study	242.9	248.7	249.8	250.8	251.6	253.0	253.2	253.7	253.9	253.5	251.11	0.00
		FAPRI (2014)	196.0	205.0	215.0	218.0	218.0	219.0	218.0	218.0	219.0	219.0	214.50	17.07
	Farm Price (US$/Bushel)	This Study	2.08	2.33	2.30	2.30	2.23	2.18	2.15	2.10	2.06	2.06	2.18	0.00
		FAPRI (2014)	3.62	3.44	3.27	3.20	3.19	3.17	3.16	2.14	3.12	3.10	3.14	-30.64
	Expected Net Returns (US$/Acre)	This Study	98.1	38.3	43.2	41.0	38.8	37.3	34.0	31.8	29.2	26.6	41.82	0.00
		FAPRI (2014)	112.4	106.8	101.5	98.7	99.6	97.7	14.8	96.5	93.4	91.4	91.28	-54.18

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

Table C-108 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Average	% Difference
LG and MSG Rice	Planted Acres (Mil. Acres)	This Study	2.48	3.38	3.52	3.52	3.50	3.52	3.56	3.55	3.54	3.53	3.41	0.00
		FAPRI (2014)	2.49	2.68	2.69	2.62	2.62	2.60	2.59	2.57	2.56	2.56	2.60	31.24
	Harvested Acres (Mil. Acres)	This Study	2.44	3.31	3.46	3.46	3.44	3.46	3.50	3.49	3.48	3.48	3.35	0.00
		FAPRI (2014)	2.47	2.64	2.65	2.59	2.59	2.57	2.56	2.54	2.53	2.53	2.57	30.58
	Yields (Cwt/Acre)	This Study	81.91	60.88	62.44	63.91	65.21	65.60	65.52	66.30	67.03	67.61	66.64	0.00
		FAPRI (2014)	76.94	74.61	75.26	76.02	76.69	77.27	77.78	78.37	78.98	79.65	77.16	-13.63
	Total Supply (Mil. Cwt)	This Study	252.7	257.5	272.2	276.9	280.4	283.1	285.4	287.4	289.3	291.2	277.62	0.00
		FAPRI (2014)	238.9	246.4	248.4	247.6	250.2	251.1	252.3	253.5	254.7	256.8	249.99	11.05
	Total Demand (Mil. Cwt)	This Study	268.5	272.1	282.1	285.6	289.1	292.7	296.3	299.9	303.4	307.0	289.69	0.00
		FAPRI (2014)	247.3	246.4	248.4	247.5	250.2	251.1	252.2	253.6	254.7	256.8	250.82	15.50
	Farm Price (US$/Cwt)	This Study	17.41	17.42	16.41	16.44	16.47	16.48	16.49	16.50	16.51	16.52	16.67	0.00
		FAPRI (2014)	15.82	14.81	13.67	13.73	13.70	13.67	13.68	13.69	13.72	13.72	14.02	18.86
	Expected Net Returns (US$/Acre)	This Study	618.1	820.7	828.2	749.9	759.0	766.5	772.2	778.6	785.1	791.4	766.95	0.00
		FAPRI (2014)	756.1	599.9	581.8	590.6	594.7	590.8	587.2	584.6	578.2	580.6	604.45	26.88
Sorghum	Planted Acres (Mil. Acres)	This Study	6.90	7.36	7.43	7.43	7.45	7.47	7.48	7.45	7.43	7.41	7.38	0.00
		FAPRI (2014)	8.06	7.60	7.90	7.92	7.90	7.92	7.90	7.85	7.82	7.79	7.87	-6.17
	Harvested Acres (Mil. Acres)	This Study	6.03	6.28	6.40	6.45	6.47	6.47	6.46	6.44	6.43	6.41	6.38	0.00
		FAPRI (2014)	6.53	5.97	6.20	6.21	6.19	6.21	6.20	6.16	6.13	6.11	6.19	3.09
	Yields (Bushels/Acre)	This Study	66.13	65.85	65.79	65.85	65.95	66.06	66.18	66.29	66.41	66.54	66.10	0.00
		FAPRI (2014)	59.60	64.60	64.80	65.20	65.40	65.70	66.10	66.20	66.40	66.40	65.04	1.64
	Total Supply (Mil. Bushels)	This Study	439.5	439.4	447.1	450.7	452.4	453.2	453.4	453.2	452.8	452.3	449.38	0.00
		FAPRI (2014)	412.0	410.0	435.0	443.0	446.0	449.0	452.0	452.0	453.0	452.0	451.00	-0.36
	Total Demand (Mil. Bushels)	This Study	439.5	439.4	447.1	450.7	452.5	453.2	453.4	453.2	452.8	452.3	449.39	0.00
		FAPRI (2014)	404.0	410.0	434.0	444.0	446.0	450.0	452.0	452.0	453.0	452.0	439.70	2.20
	Farm Price (US$/Bushel)	This Study	4.42	4.91	4.65	4.73	4.60	4.57	4.48	4.42	4.34	4.39	4.55	0.00
		FAPRI (2014)	4.19	4.03	3.85	3.84	3.84	3.85	3.79	3.77	3.74	3.73	3.86	17.78
	Expected Net Returns (US$/Acre)	This Study	190.5	145.0	170.7	154.4	156.6	146.7	141.8	134.6	128.9	122.0	149.12	0.00
		FAPRI (2014)	131.8	153.4	152.7	149.6	146.8	146.3	145.9	143.0	139.6	138.0	144.71	3.05

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

Table C-108 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Average	% Difference
Soybeans	Planted Acres (Mil. Acres)	This Study	77.16	79.24	79.73	80.79	81.64	82.63	83.51	84.44	85.32	86.20	82.07	0.00
		FAPRI (2014)	76.50	78.70	75.70	76.00	76.50	76.30	76.60	76.80	77.00	77.20	76.73	6.95
	Harvested Acres (Mil. Acres)	This Study	75.90	77.97	78.49	79.55	80.40	81.38	82.26	83.18	84.05	84.92	80.81	0.00
		FAPRI (2014)	75.90	77.70	74.80	75.10	75.50	75.30	75.60	75.80	76.00	76.20	75.79	6.62
	Yields (Cwt/Acre)	This Study	45.19	44.26	44.66	45.03	45.40	45.76	46.12	46.47	46.83	47.18	45.69	0.00
		FAPRI (2014)	43.30	44.60	45.10	45.60	46.10	46.50	46.90	47.30	47.80	48.10	46.13	-0.95
	Total Supply (Mil. Cwt)	This Study	3618.6	3708.9	3763.4	3840.2	3908.1	3981.9	4051.9	4123.7	4194.0	4264.7	3945.54	0.00
		FAPRI (2014)	3454.0	3630.0	3622.0	3676.0	3734.0	3762.0	3808.0	3853.0	3893.0	3936.0	3736.80	5.59
	Total Demand (Mil. Cwt)	This Study	3618.7	3708.8	3763.4	3840.4	3908.2	3981.8	4051.9	4123.6	4194.2	4264.8	3945.57	0.00
		FAPRI (2014)	3454.0	3630.0	3622.0	3676.0	3732.0	3762.0	3628.0	3853.0	3892.0	3936.0	3718.50	6.11
	Farm Price (US$/Cwt)	This Study	14.63	14.69	15.33	15.19	15.16	14.90	14.70	14.43	14.18	13.92	14.71	0.00
		FAPRI (2014)	12.57	9.84	9.80	9.68	9.68	9.77	9.85	9.87	9.94	9.89	10.09	45.82
	Expected Net Returns (US$/Acre)	This Study	437.4	519.2	525.1	556.8	553.1	554.7	545.8	538.9	528.7	519.5	527.91	0.00
		FAPRI (2014)	407.0	324.0	331.0	331.2	331.7	334.1	336.0	335.9	340.6	341.6	341.31	54.67
Wheat	Planted Acres (Mil. Acres)	This Study	56.53	57.56	57.38	57.02	56.42	55.76	55.24	54.86	54.45	54.02	55.92	0.00
		FAPRI (2014)	56.20	57.00	57.00	56.50	56.70	56.60	56.40	56.20	56.20	56.10	56.49	-1.00
	Harvested Acres (Mil. Acres)	This Study	47.89	49.51	49.32	48.99	48.45	47.85	47.38	47.04	46.67	46.28	47.94	0.00
		FAPRI (2014)	45.20	48.10	48.30	47.90	47.90	47.70	47.50	47.40	47.30	47.30	47.46	1.01
	Yields (Bushels/Acre)	This Study	45.91	46.42	46.76	47.13	47.53	47.93	48.35	48.78	49.21	49.64	47.77	0.00
		FAPRI (2014)	47.20	45.70	46.00	46.40	46.80	47.10	47.40	47.80	48.10	48.40	47.09	1.44
	Total Supply (Mil. Bushels)	This Study	3021.5	3240.8	3227.0	3250.1	3252.8	3232.2	3229.8	3234.2	3236.6	3236.9	3216.20	0.00
		FAPRI (2014)	3007.0	2964.0	3040.0	3067.0	3096.0	3110.0	3123.0	3136.0	3150.0	3168.0	3086.10	4.22
	Total Demand (Mil. Bushels)	This Study	3021.5	3240.8	3227.0	3250.1	3252.8	3232.2	3229.8	3234.2	3236.6	3236.9	3216.20	0.00
		FAPRI (2014)	3008.0	2964.0	3040.0	3067.0	3096.0	3110.0	3123.0	3136.0	3150.0	3168.0	3086.20	4.21
	Farm Price (US$/Bushel)	This Study	8.44	6.85	6.55	6.34	6.13	6.15	6.12	6.03	5.92	5.92	6.44	0.00
		FAPRI (2014)	6.82	5.55	5.37	5.32	5.31	5.28	5.26	5.25	5.23	5.23	5.46	17.99
	Expected Net Returns (US$/Acre)	This Study	230.8	279.7	208.4	194.9	186.0	176.5	177.2	176.4	172.4	167.2	196.94	0.00
		FAPRI (2014)	231.9	164.1	166.6	166.5	164.9	161.9	160.8	159.7	157.2	158.1	169.15	16.43

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

Table C-108 (Continued)

Crop	Year	Region	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Average	% Difference
Peanuts	Planted Acres (Mil. Acres)	This Study	1.14	1.13	1.12	1.10	1.09	1.08	1.07	1.06	1.05	1.03	1.09	0.00
		FAPRI (2014)	1.07	1.11	1.26	1.27	1.28	1.27	1.26	1.26	1.26	1.25	1.23	-11.62
	Harvested Acres (Mil. Acres)	This Study	1.01	1.00	0.99	0.98	0.97	0.95	0.94	0.93	0.94	0.93	0.96	0.00
		FAPRI (2014)	1.04	1.07	1.22	1.23	1.24	1.23	1.22	1.22	1.22	1.21	1.19	-19.10
	Yields (Pounds/Acre)	This Study	3568.23	3471.94	3430.71	3499.20	3510.88	3532.50	3573.55	3593.18	3531.50	3555.82	3526.75	0.00
		FAPRI (2014)	4006.00	3658.00	3713.00	3773.00	3826.00	3891.00	3949.00	4007.00	4071.00	4124.00	3901.80	-9.61
	Total Supply (Mil. lbs)	This Study	5172.4	5033.3	5048.6	4970.9	4879.2	4838.7	4914.8	4889.8	4847.7	4824.5	4941.98	0.00
		FAPRI (2014)	6552.0	6298.0	6427.0	6533.0	6666.0	6775.0	6832.0	6912.0	7012.0	7096.0	7170.00	-31.07
	Total Demand (Mil. lbs)	This Study	5172.4	5033.3	5048.6	4970.9	4879.2	4838.7	4914.8	4889.8	4847.7	4824.5	4941.98	0.00
		FAPRI (2014)	7010.0	6298.0	6426.0	6533.0	6667.0	6774.0	6843.0	6912.0	7011.0	7096.0	6757.00	-26.86
	Farm Price (US$/lb)	This Study	0.32	0.35	0.32	0.31	0.32	0.34	0.31	0.30	0.30	0.30	0.32	0.00
		FAPRI (2014)	0.21	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.22	0.22	0.23	38.77
	Expected Net Returns (US$/Acre)	This Study	841.7	592.2	722.6	612.4	593.9	617.6	674.9	589.8	562.8	559.8	636.77	0.00
		FAPRI (2014)	401.9	440.1	476.9	487.8	496.0	493.6	503.8	525.4	514.2	517.3	485.70	31.10

Note: Expected net returns (ENRs) by this study are calculated as a weighted average of regional ENRs.

APPENDIX D

FORECAST RESULT FOR THE CROP SECTOR MODEL

Table D-1. Forecast Result for the U.S. Corn Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	97.379	88.016	89.616	89.543	90.546	91.018	91.807	92.448	93.172	93.846
	CB	39.700	37.608	38.314	38.075	38.440	38.511	38.758	38.923	39.135	39.318
	CP	15.950	15.475	15.877	15.959	16.246	16.430	16.676	16.892	17.125	17.347
	DS	2.700	1.934	2.011	2.051	2.115	2.168	2.227	2.283	2.341	2.398
	FW	1.423	1.442	1.468	1.496	1.525	1.553	1.581	1.610	1.638	1.666
	LS	15.700	13.841	14.042	13.983	14.089	14.114	14.187	14.237	14.300	14.356
	NE	3.736	3.288	3.285	3.259	3.248	3.230	3.215	3.199	3.184	3.169
	NP	10.030	7.732	7.879	8.022	8.168	8.312	8.457	8.602	8.747	8.892
	SE	5.210	3.802	3.807	3.716	3.685	3.624	3.581	3.530	3.483	3.433
	SP	2.930	2.894	2.933	2.982	3.029	3.076	3.124	3.171	3.219	3.267
Harvested Acres (Mil. Acres)	U.S.	89.031	80.169	81.700	81.614	82.565	83.004	83.750	84.352	85.036	85.669
	CB	38.631	36.535	37.242	37.003	37.369	37.439	37.687	37.852	38.064	38.248
	CP	14.901	14.462	14.834	14.909	15.175	15.345	15.572	15.772	15.987	16.191
	DS	2.609	1.854	1.931	1.970	2.033	2.085	2.143	2.198	2.256	2.312
	FW	0.540	0.545	0.552	0.559	0.567	0.575	0.583	0.590	0.598	0.606
	LS	13.934	12.163	12.355	12.299	12.399	12.423	12.493	12.541	12.601	12.654
	NE	2.379	2.074	2.071	2.054	2.046	2.034	2.024	2.013	2.003	1.992
	NP	9.157	6.848	6.996	7.140	7.286	7.431	7.577	7.722	7.868	8.013
	SE	4.461	3.295	3.298	3.223	3.198	3.147	3.112	3.069	3.030	2.989
	SP	2.419	2.393	2.421	2.457	2.491	2.526	2.560	2.595	2.629	2.664
Yields (Bushels/Acre)	CB	170.445	172.272	174.099	175.926	177.753	179.581	181.408	183.235	185.062	186.889
	CP	154.587	155.537	156.487	157.436	158.386	159.336	160.285	161.235	162.185	163.134
	DS	147.387	149.511	151.636	153.761	155.885	158.010	160.134	162.259	164.384	166.508
	FW	189.529	190.926	192.323	193.719	195.116	196.513	197.910	199.307	200.704	202.101
	LS	161.428	163.280	165.132	166.984	168.836	170.687	172.539	174.391	176.243	178.095
	NE	131.211	132.473	133.736	134.998	136.260	137.522	138.784	140.046	141.308	142.570
	NP	136.029	138.265	140.502	142.738	144.975	147.211	149.448	151.684	153.921	156.157
	SE	122.377	123.651	124.926	126.200	127.474	128.748	130.023	131.297	132.571	133.846
	SP	129.815	130.667	131.520	132.372	133.224	134.076	134.929	135.781	136.633	137.486
Total Supply (Mil. Bushels)	U.S.	13,981.2	13,758.3	14,140.6	14,256.4	14,547.6	14,754.6	15,015.9	15,254.7	15,509.7	15,758.2
Production (Mil. Bushels)	U.S.	12,541.8	12,852.3	13,234.6	13,350.4	13,641.6	13,848.6	14,109.9	14,348.7	14,603.7	14,852.2
Total Demand (Mil. Bushels)	U.S.	13,981.2	13,758.3	14,140.6	14,256.3	14,547.6	14,754.6	15,015.9	15,254.7	15,509.7	15,758.2
Seed (Mil. Bushels)	U.S.	22.281	22.673	22.655	22.901	23.017	23.210	23.367	23.545	23.710	23.956
Feed and Residual (Mil. Bushels)	U.S.	5,625.54	5,457.57	5,621.19	5,604.31	5,705.15	5,752.50	5,831.90	5,897.68	5,974.12	5,981.48
Food and Industrial (Mil. Bushels)	U.S.	1,498.92	1,499.24	1,528.27	1,542.70	1,566.86	1,586.71	1,609.19	1,630.58	1,652.86	1,669.06
Alcohol (Mil. Bushels)	U.S.	3,948.42	3,940.26	4,108.89	4,240.57	4,397.22	4,537.67	4,691.40	4,839.98	4,991.15	5,125.34
Exports (Mil. Bushels)	U.S.	1,995.05	1,947.54	1,968.64	1,954.87	1,964.35	1,963.53	1,969.00	1,971.86	1,976.84	1,967.30

Table D-1 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	4.272	4.758	4.542	4.683	4.586	4.594	4.538	4.509	4.458	4.556
	CB	4.357	4.864	4.639	4.786	4.685	4.693	4.635	4.605	4.551	4.653
	CP	4.262	4.746	4.531	4.671	4.574	4.583	4.527	4.498	4.447	4.544
	DS	4.294	4.751	4.548	4.680	4.589	4.597	4.544	4.517	4.469	4.561
	FW	4.686	5.126	4.931	5.058	4.970	4.978	4.927	4.901	4.855	4.943
	LS	4.176	4.662	4.446	4.587	4.490	4.498	4.442	4.413	4.362	4.460
	NE	4.884	5.434	5.190	5.349	5.239	5.249	5.185	5.152	5.095	5.205
	NP	4.212	4.734	4.502	4.654	4.550	4.559	4.498	4.467	4.412	4.517
	SE	4.572	5.080	4.854	5.001	4.900	4.909	4.850	4.820	4.767	4.868
	SP	4.396	4.840	4.643	4.772	4.683	4.691	4.639	4.613	4.566	4.655
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	279.614	286.098	292.581	299.064	305.548	312.031	318.514	324.998	331.481	337.964
Expected Net Returns ($/Acre)	CB	502.377	487.421	576.257	539.446	567.294	551.565	555.212	546.715	543.105	535.208
	CP	869.425	403.617	476.436	440.828	460.725	443.383	442.573	431.515	424.634	414.205
	DS	874.280	377.644	448.606	421.437	444.981	434.224	438.736	433.596	432.303	427.550
	FW	442.595	632.941	716.986	680.086	705.187	688.640	690.590	681.040	676.161	667.279
	LS	783.677	418.861	499.464	465.965	491.235	476.869	480.130	472.324	468.964	461.683
	NE	737.231	385.625	458.108	425.837	447.405	432.727	434.159	425.521	420.948	412.835
	NP	435.856	317.782	392.876	364.411	389.587	378.411	383.428	378.162	376.973	372.069
	SE	408.983	304.289	366.390	338.216	356.482	343.459	344.346	336.522	332.207	324.819
	SP	534.151	315.394	370.767	342.429	356.964	342.723	341.259	331.866	325.702	316.787

Table D-2. Forecast Result for the U.S. Corn Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	97.379	88.212	89.974	89.887	90.955	91.385	92.196	92.790	93.513	94.149
	CB	39.700	37.722	38.520	38.274	38.675	38.722	38.980	39.119	39.329	39.492
	CP	15.950	15.509	15.943	16.021	16.322	16.497	16.747	16.954	17.186	17.400
	DS	2.700	1.939	2.020	2.059	2.125	2.176	2.236	2.291	2.349	2.406
	FW	1.423	1.444	1.469	1.496	1.525	1.553	1.582	1.610	1.638	1.666
	LS	15.700	13.869	14.096	14.034	14.150	14.168	14.244	14.287	14.350	14.400
	NE	3.736	3.291	3.289	3.264	3.253	3.234	3.221	3.204	3.189	3.173
	NP	10.030	7.732	7.880	8.023	8.168	8.313	8.458	8.603	8.747	8.892
	SE	5.210	3.812	3.825	3.732	3.706	3.642	3.600	3.546	3.499	3.447
	SP	2.930	2.895	2.934	2.984	3.032	3.080	3.128	3.177	3.225	3.274
Harvested Acres (Mil. Acres)	U.S.	89.031	80.357	82.046	81.946	82.959	83.359	84.125	84.682	85.364	85.961
	CB	38.631	36.649	37.449	37.202	37.604	37.651	37.909	38.048	38.259	38.422
	CP	14.901	14.494	14.895	14.967	15.244	15.406	15.638	15.828	16.043	16.241
	DS	2.609	1.859	1.939	1.978	2.043	2.093	2.152	2.206	2.264	2.319
	FW	0.540	0.545	0.552	0.560	0.567	0.575	0.583	0.590	0.598	0.606
	LS	13.934	12.190	12.406	12.347	12.457	12.475	12.547	12.588	12.648	12.696
	NE	2.379	2.076	2.075	2.057	2.050	2.037	2.028	2.016	2.006	1.995
	NP	9.157	6.848	6.996	7.140	7.287	7.432	7.577	7.723	7.868	8.014
	SE	4.461	3.302	3.313	3.237	3.215	3.162	3.128	3.082	3.044	3.000
	SP	2.419	2.394	2.422	2.459	2.493	2.528	2.563	2.599	2.634	2.669
Yields (Bushels/Acre)	CB	170.445	172.272	174.099	175.926	177.753	179.581	181.408	183.235	185.062	186.889
	CP	154.587	155.537	156.487	157.436	158.386	159.336	160.285	161.235	162.185	163.134
	DS	147.387	149.511	151.636	153.761	155.885	158.010	160.134	162.259	164.384	166.508
	FW	189.529	190.926	192.323	193.719	195.116	196.513	197.910	199.307	200.704	202.101
	LS	161.428	163.280	165.132	166.984	168.836	170.687	172.539	174.391	176.243	178.095
	NE	131.211	132.473	133.736	134.998	136.260	137.522	138.784	140.046	141.308	142.570
	NP	136.029	138.265	140.502	142.738	144.975	147.211	149.448	151.684	153.921	156.157
	SE	122.377	123.651	124.926	126.200	127.474	128.748	130.023	131.297	132.571	133.846
	SP	129.815	130.667	131.520	132.372	133.224	134.076	134.929	135.781	136.633	137.486
Total Supply (Mil. Bushels)	U.S.	13,981.2	13,789.4	14,198.2	14,312.2	14,614.6	14,815.4	15,080.7	15,312.2	15,567.5	15,810.0
Production (Mil. Bushels)	U.S.	12,541.8	12,883.4	13,292.2	13,406.2	13,708.6	13,909.4	14,174.7	14,406.2	14,661.5	14,904.0
Total Demand (Mil. Bushels)	U.S.	13,981.2	13,789.4	14,198.2	14,312.2	14,614.6	14,815.4	15,080.7	15,312.2	15,567.5	15,810.0
Seed (Mil. Bushels)	U.S.	22.329	22.761	22.740	23.001	23.107	23.305	23.451	23.628	23.784	24.031
Feed and Residual (Mil. Bushels)	U.S.	5,689.69	5,541.35	5,722.25	5,704.00	5,812.26	5,855.47	5,937.76	5,998.82	6,075.56	6,079.12
Food and Industrial (Mil. Bushels)	U.S.	1,506.16	1,508.34	1,538.87	1,553.24	1,578.01	1,597.52	1,620.21	1,641.18	1,663.44	1,679.30
Alcohol (Mil. Bushels)	U.S.	3,968.18	3,965.12	4,137.86	4,269.35	4,427.67	4,567.17	4,721.46	4,868.90	5,020.04	5,153.28
Exports (Mil. Bushels)	U.S.	1,903.86	1,860.81	1,885.52	1,871.59	1,882.53	1,880.89	1,886.85	1,888.71	1,893.65	1,883.29

Table D-2 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	4.095	4.535	4.282	4.425	4.313	4.330	4.269	4.250	4.199	4.305
	CB	4.173	4.632	4.368	4.517	4.400	4.418	4.354	4.334	4.281	4.392
	CP	4.086	4.524	4.273	4.414	4.303	4.320	4.259	4.240	4.190	4.295
	DS	4.128	4.542	4.304	4.438	4.333	4.348	4.291	4.273	4.226	4.325
	FW	4.526	4.925	4.696	4.825	4.724	4.739	4.684	4.666	4.621	4.717
	LS	3.999	4.439	4.186	4.329	4.217	4.234	4.173	4.154	4.103	4.209
	NE	4.684	5.182	4.896	5.057	4.931	4.950	4.881	4.859	4.802	4.922
	NP	4.022	4.495	4.224	4.377	4.257	4.275	4.209	4.189	4.135	4.248
	SE	4.387	4.847	4.583	4.732	4.615	4.633	4.569	4.549	4.496	4.607
	SP	4.234	4.637	4.405	4.536	4.433	4.449	4.393	4.376	4.329	4.426
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	279.614	286.098	292.581	299.064	305.548	312.031	318.514	324.998	331.481	337.964
Expected Net Returns ($/Acre)	CB	502.377	455.968	536.252	492.322	519.972	500.986	505.684	495.742	493.578	485.249
	CP	869.425	376.399	441.973	400.414	420.319	400.382	400.645	388.543	383.053	372.431
	DS	874.280	353.135	417.318	384.451	407.710	394.252	399.466	393.049	392.781	387.560
	FW	442.595	602.604	678.527	634.932	659.988	640.481	643.579	632.803	629.432	620.281
	LS	783.677	390.312	463.125	423.129	448.188	430.827	435.015	425.861	423.789	416.085
	NE	737.231	359.385	424.769	386.607	408.052	390.708	393.056	383.259	379.925	371.493
	NP	435.856	291.949	359.833	325.274	350.074	335.958	341.646	334.946	334.780	329.306
	SE	408.983	281.686	337.650	304.372	322.506	307.155	308.807	299.955	296.687	288.999
	SP	534.151	294.386	344.156	311.210	325.738	309.478	308.831	298.617	293.516	284.439

Table D-3. Forecast Result for the U.S. Corn Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	97.379	87.876	89.282	89.224	90.154	90.665	91.431	92.111	92.837	93.540
	CB	39.700	37.526	38.122	37.890	38.216	38.308	38.543	38.730	38.943	39.144
	CP	15.950	15.450	15.816	15.901	16.174	16.366	16.607	16.831	17.064	17.292
	DS	2.700	1.931	2.004	2.044	2.106	2.159	2.218	2.275	2.333	2.391
	FW	1.423	1.441	1.467	1.495	1.524	1.552	1.581	1.609	1.638	1.666
	LS	15.700	13.821	13.992	13.936	14.031	14.062	14.132	14.188	14.252	14.312
	NE	3.736	3.287	3.280	3.255	3.243	3.225	3.211	3.195	3.180	3.165
	NP	10.030	7.732	7.878	8.022	8.167	8.312	8.457	8.601	8.746	8.891
	SE	5.210	3.796	3.790	3.700	3.666	3.607	3.563	3.514	3.467	3.419
	SP	2.930	2.893	2.933	2.981	3.027	3.074	3.120	3.167	3.214	3.261
Harvested Acres (Mil. Acres)	U.S.	89.031	80.034	81.378	81.306	82.187	82.664	83.388	84.028	84.713	85.376
	CB	38.631	36.453	37.050	36.818	37.144	37.236	37.471	37.659	37.873	38.073
	CP	14.901	14.440	14.777	14.856	15.108	15.285	15.508	15.715	15.930	16.141
	DS	2.609	1.851	1.923	1.962	2.024	2.076	2.134	2.191	2.248	2.304
	FW	0.540	0.545	0.552	0.559	0.567	0.575	0.583	0.590	0.598	0.606
	LS	13.934	12.144	12.307	12.254	12.344	12.374	12.440	12.494	12.555	12.612
	NE	2.379	2.073	2.068	2.051	2.043	2.031	2.021	2.010	2.000	1.990
	NP	9.157	6.848	6.995	7.139	7.285	7.430	7.576	7.722	7.867	8.013
	SE	4.461	3.290	3.284	3.210	3.182	3.133	3.096	3.055	3.017	2.977
	SP	2.419	2.392	2.421	2.457	2.490	2.524	2.558	2.592	2.626	2.660
Yields (Bushels/Acre)	CB	170.445	172.272	174.099	175.926	177.753	179.581	181.408	183.235	185.062	186.889
	CP	154.587	155.537	156.487	157.436	158.386	159.336	160.285	161.235	162.185	163.134
	DS	147.387	149.511	151.636	153.761	155.885	158.010	160.134	162.259	164.384	166.508
	FW	189.529	190.926	192.323	193.719	195.116	196.513	197.910	199.307	200.704	202.101
	LS	161.428	163.280	165.132	166.984	168.836	170.687	172.539	174.391	176.243	178.095
	NE	131.211	132.473	133.736	134.998	136.260	137.522	138.784	140.046	141.308	142.570
	NP	136.029	138.265	140.502	142.738	144.975	147.211	149.448	151.684	153.921	156.157
	SE	122.377	123.651	124.926	126.200	127.474	128.748	130.023	131.297	132.571	133.846
	SP	129.815	130.667	131.520	132.372	133.224	134.076	134.929	135.781	136.633	137.486
Total Supply (Mil. Bushels)	U.S.	13,981.2	13,736.0	14,086.9	14,204.5	14,483.5	14,696.3	14,953.2	15,198.1	15,452.8	15,705.9
Production (Mil. Bushels)	U.S.	12,541.8	12,830.0	13,180.9	13,298.5	13,577.5	13,790.3	14,047.2	14,292.1	14,546.8	14,799.9
Total Demand (Mil. Bushels)	U.S.	13,981.2	13,736.0	14,087.0	14,204.5	14,483.5	14,696.3	14,953.2	15,198.0	15,452.8	15,705.9
Seed (Mil. Bushels)	U.S.	22.247	22.591	22.577	22.805	22.930	23.118	23.285	23.463	23.635	23.881
Feed and Residual (Mil. Bushels)	U.S.	5,560.60	5,378.98	5,522.16	5,506.85	5,599.57	5,650.84	5,727.30	5,797.03	5,873.22	5,883.60
Food and Industrial (Mil. Bushels)	U.S.	1,491.82	1,490.73	1,517.96	1,532.45	1,555.93	1,576.08	1,598.34	1,620.07	1,642.34	1,658.81
Alcohol (Mil. Bushels)	U.S.	3,929.01	3,917.03	4,080.76	4,212.59	4,367.38	4,508.66	4,661.77	4,811.28	4,962.44	5,097.35
Exports (Mil. Bushels)	U.S.	2,086.55	2,035.68	2,052.49	2,038.84	2,046.70	2,046.61	2,051.54	2,055.20	2,060.18	2,051.27

Table D-3 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	4.446	4.966	4.794	4.934	4.854	4.854	4.804	4.767	4.716	4.807
	CB	4.538	5.081	4.902	5.047	4.964	4.965	4.912	4.873	4.820	4.915
	CP	4.435	4.953	4.782	4.921	4.841	4.842	4.791	4.754	4.703	4.794
	DS	4.457	4.946	4.785	4.916	4.841	4.841	4.794	4.759	4.711	4.797
	FW	4.843	5.314	5.159	5.285	5.212	5.213	5.167	5.134	5.088	5.170
	LS	4.349	4.870	4.698	4.837	4.757	4.758	4.708	4.670	4.619	4.710
	NE	5.081	5.669	5.474	5.632	5.541	5.542	5.485	5.443	5.386	5.489
	NP	4.399	4.958	4.773	4.923	4.837	4.838	4.783	4.743	4.689	4.786
	SE	4.753	5.297	5.117	5.263	5.179	5.180	5.127	5.088	5.035	5.130
	SP	4.555	5.031	4.873	5.001	4.928	4.928	4.882	4.848	4.801	4.885
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	279.614	286.098	292.581	299.064	305.548	312.031	318.514	324.998	331.481	337.964
Expected Net Returns ($/Acre)	CB	502.377	518.322	613.652	585.220	613.309	601.152	603.902	596.951	592.274	584.873
	CP	869.425	430.357	508.649	480.084	500.015	485.540	483.793	473.866	465.915	455.735
	DS	874.280	401.724	477.852	457.364	481.222	473.411	477.342	473.557	471.539	467.305
	FW	442.595	662.747	752.934	723.947	749.138	735.854	736.807	728.580	722.552	714.001
	LS	783.677	446.910	533.432	507.575	533.094	522.008	524.484	518.117	513.812	507.013
	NE	737.231	411.405	489.272	463.943	485.672	473.922	474.569	467.172	461.674	453.934
	NP	435.856	343.162	423.763	402.427	428.008	420.032	424.504	420.753	418.861	414.580
	SE	408.983	326.495	393.254	371.090	389.520	379.051	379.285	372.560	367.470	360.429
	SP	534.151	336.034	395.641	372.754	387.328	375.316	373.140	364.635	357.654	348.944

Table D-4. Forecast Result for the U.S. Corn Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	97.379	90.331	90.521	91.168	91.369	91.847	92.241	92.686	93.112	93.539
	CB	39.700	38.913	38.820	38.983	38.895	38.965	38.990	39.045	39.090	39.139
	CP	15.950	15.911	16.051	16.274	16.411	16.599	16.769	16.948	17.121	17.292
	DS	2.700	1.986	2.032	2.088	2.134	2.186	2.237	2.288	2.339	2.391
	FW	1.423	1.445	1.470	1.500	1.528	1.556	1.584	1.612	1.640	1.668
	LS	15.700	14.198	14.180	14.231	14.214	14.239	14.252	14.274	14.292	14.311
	NE	3.736	3.318	3.296	3.280	3.258	3.240	3.221	3.202	3.184	3.165
	NP	10.030	7.737	7.881	8.026	8.169	8.314	8.458	8.603	8.747	8.891
	SE	5.210	3.930	3.857	3.807	3.733	3.673	3.609	3.547	3.483	3.419
	SP	2.930	2.893	2.934	2.981	3.028	3.073	3.120	3.167	3.215	3.263
Harvested Acres (Mil. Acres)	U.S.	89.031	82.402	82.572	83.179	83.357	83.802	84.166	84.580	84.975	85.373
	CB	38.631	37.842	37.749	37.912	37.824	37.895	37.919	37.974	38.020	38.069
	CP	14.901	14.865	14.994	15.200	15.327	15.501	15.658	15.823	15.983	16.141
	DS	2.609	1.905	1.950	2.006	2.051	2.103	2.152	2.203	2.254	2.304
	FW	0.540	0.546	0.553	0.561	0.568	0.576	0.583	0.591	0.599	0.606
	LS	13.934	12.504	12.487	12.534	12.519	12.543	12.555	12.575	12.593	12.611
	NE	2.379	2.094	2.079	2.068	2.054	2.041	2.028	2.015	2.003	1.990
	NP	9.157	6.853	6.998	7.143	7.288	7.433	7.578	7.723	7.868	8.013
	SE	4.461	3.401	3.340	3.299	3.237	3.188	3.135	3.083	3.030	2.977
	SP	2.419	2.392	2.422	2.456	2.490	2.523	2.557	2.592	2.626	2.662
Yields (Bushels/Acre)	CB	170.445	172.272	174.099	175.926	177.753	179.581	181.408	183.235	185.062	186.889
	CP	154.587	155.537	156.487	157.436	158.386	159.336	160.285	161.235	162.185	163.134
	DS	147.387	149.511	151.636	153.761	155.885	158.010	160.134	162.259	164.384	166.508
	FW	189.529	190.926	192.323	193.719	195.116	196.513	197.910	199.307	200.704	202.101
	LS	161.428	163.280	165.132	166.984	168.836	170.687	172.539	174.391	176.243	178.095
	NE	131.211	132.473	133.736	134.998	136.260	137.522	138.784	140.046	141.308	142.570
	NP	136.029	138.265	140.502	142.738	144.975	147.211	149.448	151.684	153.921	156.157
	SE	122.377	123.651	124.926	126.200	127.474	128.748	130.023	131.297	132.571	133.846
	SP	129.815	130.667	131.520	132.372	133.224	134.076	134.929	135.781	136.633	137.486
Total Supply (Mil. Bushels)	U.S.	13,981.2	14,126.0	14,285.5	14,519.1	14,681.7	14,890.9	15,087.5	15,294.2	15,498.8	15,705.3
Production (Mil. Bushels)	U.S.	12,541.8	13,220.0	13,379.5	13,613.1	13,775.7	13,984.9	14,181.5	14,388.2	14,592.8	14,799.3
Total Demand (Mil. Bushels)	U.S.	13,981.2	14,126.0	14,285.5	14,519.1	14,681.8	14,890.9	15,087.5	15,294.2	15,498.8	15,705.3
Seed (Mil. Bushels)	U.S.	22.848	22.895	23.054	23.103	23.220	23.316	23.426	23.530	23.635	23.823
Feed and Residual (Mil. Bushels)	U.S.	4,951.20	5,034.27	4,996.16	5,160.33	5,270.76	5,416.63	5,551.99	5,695.06	5,836.42	5,905.11
Food and Industrial (Mil. Bushels)	U.S.	1,439.43	1,459.98	1,471.97	1,501.65	1,527.09	1,555.54	1,583.16	1,611.49	1,639.71	1,661.54
Alcohol (Mil. Bushels)	U.S.	4,823.92	4,864.12	5,069.23	5,086.23	5,100.40	5,115.37	5,131.17	5,146.92	5,162.64	5,174.52
Exports (Mil. Bushels)	U.S.	1,852.82	1,853.68	1,834.06	1,856.75	1,869.28	1,889.01	1,906.78	1,926.21	1,945.41	1,949.31

Table D-4 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	5.728	5.719	5.920	5.688	5.559	5.357	5.175	4.976	4.780	4.740
	CB	5.875	5.866	6.075	5.833	5.699	5.489	5.299	5.092	4.887	4.845
	CP	5.710	5.701	5.901	5.670	5.543	5.342	5.161	4.963	4.767	4.728
	DS	5.662	5.653	5.842	5.624	5.503	5.314	5.143	4.956	4.771	4.734
	FW	6.003	5.995	6.177	5.966	5.850	5.668	5.503	5.323	5.146	5.110
	LS	5.630	5.622	5.822	5.590	5.462	5.260	5.079	4.880	4.684	4.644
	NE	6.529	6.519	6.746	6.484	6.339	6.111	5.905	5.680	5.458	5.413
	NP	5.774	5.765	5.981	5.731	5.594	5.377	5.182	4.968	4.758	4.715
	SE	6.091	6.082	6.292	6.049	5.915	5.705	5.515	5.307	5.102	5.061
	SP	5.727	5.719	5.902	5.690	5.573	5.388	5.222	5.040	4.860	4.824
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395	24.395
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	279.614	286.098	292.581	299.064	305.548	312.031	318.514	324.998	331.481	337.964
Expected Net Returns ($/Acre)	CB	502.377	746.145	748.806	789.504	751.524	731.916	698.044	667.182	632.379	597.293
	CP	869.425	627.507	625.077	655.280	618.030	596.712	563.491	533.074	499.587	466.120
	DS	874.280	579.252	583.554	617.702	590.081	576.752	551.988	529.424	503.542	477.247
	FW	442.595	882.490	882.863	919.695	881.153	860.360	826.167	795.041	760.391	725.685
	LS	783.677	653.702	656.201	693.275	658.824	641.043	610.240	582.135	550.393	518.349
	NE	737.231	601.474	601.905	634.006	600.613	582.555	552.699	525.401	494.893	464.212
	NP	435.856	530.278	535.396	572.091	543.416	529.788	503.925	480.296	453.028	425.211
	SE	408.983	490.213	490.349	517.804	488.755	472.910	446.839	422.942	396.232	369.334
	SP	534.151	488.204	485.544	508.092	478.531	461.265	434.780	410.446	383.717	356.986

Table D-5. Forecast Result for the U.S. Corn Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	97.379	87.822	89.584	89.398	90.503	90.916	91.757	92.373	93.125	93.786
	CB	39.700	37.484	38.296	37.998	38.418	38.456	38.732	38.884	39.111	39.289
	CP	15.950	15.455	15.864	15.922	16.229	16.400	16.656	16.865	17.102	17.320
	DS	2.700	1.928	2.010	2.047	2.114	2.164	2.225	2.281	2.339	2.396
	FW	1.423	1.441	1.468	1.495	1.525	1.553	1.581	1.609	1.638	1.666
	LS	15.700	13.804	14.036	13.960	14.081	14.097	14.178	14.225	14.293	14.347
	NE	3.736	3.285	3.284	3.257	3.247	3.228	3.214	3.198	3.183	3.167
	NP	10.030	7.731	7.879	8.022	8.168	8.312	8.457	8.602	8.747	8.892
	SE	5.210	3.783	3.801	3.702	3.678	3.613	3.573	3.519	3.474	3.423
	SP	2.930	2.911	2.947	2.995	3.044	3.093	3.141	3.190	3.238	3.288
Harvested Acres (Mil. Acres)	U.S.	89.031	79.978	81.667	81.472	82.521	82.904	83.700	84.277	84.987	85.609
	CB	38.631	36.411	37.224	36.926	37.346	37.385	37.661	37.813	38.041	38.218
	CP	14.901	14.444	14.822	14.875	15.159	15.317	15.553	15.746	15.966	16.167
	DS	2.609	1.848	1.929	1.966	2.031	2.081	2.141	2.196	2.253	2.309
	FW	0.540	0.545	0.552	0.559	0.567	0.575	0.583	0.590	0.598	0.605
	LS	13.934	12.128	12.349	12.276	12.392	12.407	12.485	12.529	12.594	12.645
	NE	2.379	2.072	2.071	2.053	2.046	2.033	2.023	2.012	2.002	1.991
	NP	9.157	6.847	6.996	7.139	7.286	7.431	7.577	7.722	7.868	8.013
	SE	4.461	3.279	3.293	3.212	3.191	3.138	3.105	3.060	3.023	2.980
	SP	2.419	2.405	2.431	2.467	2.502	2.538	2.573	2.608	2.643	2.679
Yields (Bushels/Acre)	CB	170.445	172.272	174.099	175.926	177.753	179.581	181.408	183.235	185.062	186.889
	CP	154.587	155.537	156.487	157.436	158.386	159.336	160.285	161.235	162.185	163.134
	DS	147.387	149.511	151.636	153.761	155.885	158.010	160.134	162.259	164.384	166.508
	FW	189.529	190.926	192.323	193.719	195.116	196.513	197.910	199.307	200.704	202.101
	LS	161.428	163.280	165.132	166.984	168.836	170.687	172.539	174.391	176.243	178.095
	NE	131.211	132.473	133.736	134.998	136.260	137.522	138.784	140.046	141.308	142.570
	NP	136.029	138.265	140.502	142.738	144.975	147.211	149.448	151.684	153.921	156.157
	SE	122.377	123.651	124.926	126.200	127.474	128.748	130.023	131.297	132.571	133.846
	SP	129.815	130.667	131.520	132.372	133.224	134.076	134.929	135.781	136.633	137.486
Supply (Mil. Bushels)	U.S.	13981.21	13726.54	14135.05	14232.60	14540.09	14737.30	15007.09	15241.47	15501.01	15747.34
Production (Mil. Bushels)	U.S.	12541.83	12820.54	13229.05	13326.60	13634.09	13831.30	14101.09	14335.47	14595.01	14841.34
Total Demand (Mil. Bushels)	U.S.	13981.21	13726.54	14135.04	14232.60	14540.07	14737.30	15007.09	15241.47	15501.01	15747.34
Seed (Mil. Bushels)	U.S.	22.233	22.665	22.620	22.890	22.992	23.198	23.349	23.533	23.695	23.950
Feed and Residual (Mil. Bushels)	U.S.	5625.571	5436.376	5617.360	5588.322	5699.929	5740.705	5825.763	5888.559	5967.978	5973.874
Food and Industrial (Mil. Bushels)	U.S.	1498.926	1497.521	1527.982	1541.434	1566.487	1585.812	1608.766	1629.923	1652.449	1668.544
Alcohol (Mil. Bushels)	U.S.	3948.424	3935.557	4108.117	4237.108	4396.202	4535.204	4690.226	4838.168	4990.023	5123.912
Exports (Mil. Bushels)	U.S.	1995.057	1943.422	1967.965	1951.848	1963.463	1961.384	1967.984	1970.283	1975.859	1966.058

Table D-5 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	4.272	4.800	4.549	4.714	4.595	4.616	4.549	4.525	4.468	4.569
	CB	4.357	4.908	4.646	4.818	4.694	4.716	4.646	4.621	4.562	4.666
	CP	4.262	4.788	4.538	4.702	4.584	4.605	4.538	4.514	4.457	4.557
	DS	4.294	4.790	4.554	4.709	4.598	4.618	4.554	4.532	4.478	4.573
	FW	4.686	5.164	4.937	5.086	4.979	4.998	4.937	4.915	4.864	4.955
	LS	4.176	4.704	4.453	4.618	4.499	4.520	4.453	4.429	4.372	4.472
	NE	4.884	5.481	5.197	5.384	5.249	5.273	5.197	5.171	5.106	5.219
	NP	4.212	4.779	4.510	4.687	4.559	4.582	4.510	4.484	4.423	4.531
	SE	4.572	5.123	4.861	5.033	4.909	4.932	4.861	4.837	4.777	4.882
	SP	4.396	4.879	4.649	4.800	4.691	4.711	4.649	4.627	4.575	4.667
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reference Price ($/Bushel)	U.S.	3.700	3.700	3.700	3.700	3.700	3.700	3.700	3.700	3.700	3.700
Price Loss Coverage ($/Bushel)	U.S.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	279.614	286.098	292.581	299.064	305.548	312.031	318.514	324.998	331.481	337.964
Agricultural Risk Coverage ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Expected Net Returns ($/Acre)	CB	502.377	463.014	559.424	516.307	548.573	528.859	534.937	524.294	521.802	512.749
	CP	869.425	388.964	458.555	417.510	441.175	420.423	421.666	408.785	402.835	391.430
	DS	874.280	353.240	430.125	398.028	425.054	411.163	417.608	410.771	410.376	404.706
	FW	442.595	611.674	699.861	656.895	686.211	665.853	670.106	658.513	654.684	644.706
	LS	783.677	394.455	481.938	442.713	472.002	454.011	459.489	449.729	447.389	439.056
	NE	737.231	361.220	440.015	402.488	427.729	409.735	413.184	402.763	399.114	390.043
	NP	435.856	293.377	374.727	341.060	369.929	355.434	362.509	355.441	355.212	349.332
	SE	408.983	279.885	347.428	314.723	336.161	320.276	322.908	313.543	310.030	301.813
	SP	534.151	290.991	351.402	318.866	336.313	319.438	319.562	308.759	303.316	293.646

Table D-6. Forecast Result for the U.S. Barley Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	3.460	3.337	3.271	3.215	3.168	3.128	3.092	3.060	3.033	3.009
	FW	1.079	1.086	1.101	1.116	1.129	1.140	1.151	1.160	1.168	1.175
	NP	1.880	1.750	1.669	1.598	1.538	1.486	1.440	1.399	1.364	1.333
Harvested Acres (Mil. Acres)	U.S.	3.029	2.916	2.857	2.806	2.764	2.728	2.696	2.667	2.642	2.621
	FW	0.982	0.988	1.003	1.017	1.030	1.041	1.051	1.060	1.068	1.075
	NP	1.646	1.527	1.453	1.388	1.333	1.286	1.243	1.206	1.174	1.145
Yields (Bushels/Acre)	FW	83.823	84.611	85.398	86.185	86.972	87.759	88.547	89.334	90.121	90.908
	NP	59.827	60.372	60.916	61.461	62.006	62.551	63.096	63.640	64.185	64.730
Total Supply (Mil. Bushels)	U.S.	284.788	274.691	273.707	272.336	271.485	271.176	270.867	270.766	270.899	271.193
Production (Mil. Bushels)	U.S.	190.427	204.691	203.707	202.336	201.485	201.176	200.867	200.766	200.899	201.193
Total Demand (Mil. Bushels)	U.S.	284.788	274.779	273.657	272.317	270.968	270.992	270.704	270.655	270.821	271.197
Seed (Mil. Bushels)	U.S.	5.892	5.719	5.626	5.547	5.480	5.424	5.373	5.328	5.289	5.256
Feed (Mil. Bushels)	U.S.	50.924	45.359	40.559	36.529	32.052	28.531	24.657	20.977	17.341	13.994
Food (Mil. Bushels)	U.S.	142.847	143.178	147.507	152.336	156.565	161.365	166.012	170.761	175.550	180.893
Exports (Mil. Bushels)	U.S.	25.125	20.523	19.964	17.905	16.870	15.672	14.661	13.589	12.641	11.054
Farm Price ($/Bushel)	U.S.	4.308	5.348	5.394	5.628	5.741	5.892	6.018	6.158	6.289	6.510
	FW	4.390	5.348	5.390	5.606	5.710	5.849	5.965	6.094	6.214	6.418
	NP	4.249	5.304	5.350	5.588	5.702	5.855	5.983	6.125	6.258	6.482
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	125.126	128.006	130.886	133.767	136.647	139.527	142.407	145.287	148.167	151.047
Expected Net Returns ($/Acre)	FW	364.117	252.556	334.161	339.063	359.025	369.610	383.421	395.415	408.773	421.531
	NP	226.786	138.768	201.869	204.684	219.324	226.595	236.393	244.761	254.195	263.155

Table D-7. Forecast Result for the U.S. Barley Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	3.460	3.339	3.281	3.230	3.187	3.149	3.114	3.084	3.057	3.034
	FW	1.079	1.087	1.104	1.119	1.133	1.145	1.155	1.164	1.172	1.180
	NP	1.880	1.752	1.676	1.610	1.553	1.503	1.458	1.418	1.384	1.354
Harvested Acres (Mil. Acres)	U.S.	3.029	2.919	2.866	2.820	2.781	2.747	2.716	2.689	2.665	2.645
	FW	0.982	0.989	1.006	1.021	1.034	1.046	1.056	1.064	1.072	1.079
	NP	1.646	1.528	1.459	1.399	1.347	1.301	1.260	1.223	1.192	1.164
Yields (Bushels/Acre)	FW	83.823	84.611	85.398	86.185	86.972	87.759	88.547	89.334	90.121	90.908
	NP	59.827	60.372	60.916	61.461	62.006	62.551	63.096	63.640	64.185	64.730
Total Supply (Mil. Bushels)	U.S.	284.788	274.866	274.316	273.282	272.660	272.495	272.287	272.265	272.468	272.820
Production (Mil. Bushels)	U.S.	190.427	204.866	204.316	203.282	202.660	202.495	202.287	202.265	202.468	202.820
Total Demand (Mil. Bushels)	U.S.	284.782	274.840	274.278	273.145	272.213	272.631	272.391	272.493	272.620	273.109
Seed (Mil. Bushels)	U.S.	5.892	5.723	5.640	5.568	5.507	5.453	5.405	5.361	5.324	5.292
Feed (Mil. Bushels)	U.S.	54.297	48.775	44.218	40.297	36.014	32.763	28.920	25.368	21.718	18.474
Food (Mil. Bushels)	U.S.	143.653	143.756	148.116	153.004	157.301	162.159	166.784	171.556	176.327	181.681
Exports (Mil. Bushels)	U.S.	20.941	16.585	16.304	14.277	13.391	12.256	11.282	10.207	9.252	7.661
Farm Price ($/Bushel)	U.S.	4.009	5.022	5.043	5.283	5.383	5.530	5.654	5.797	5.931	6.154
	FW	4.115	5.048	5.067	5.288	5.380	5.515	5.630	5.761	5.884	6.090
	NP	3.947	4.973	4.995	5.238	5.339	5.488	5.614	5.759	5.895	6.121
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	125.126	128.006	130.886	133.767	136.647	139.527	142.407	145.287	148.167	151.047
Expected Net Returns ($/Acre)	FW	364.117	229.510	308.738	311.499	331.671	340.950	354.169	365.748	379.059	391.819
	NP	226.786	120.656	181.893	183.033	197.844	204.094	213.434	221.483	230.886	239.852

Table D-8. Forecast Result for the U.S. Barley Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	3.460	3.334	3.262	3.200	3.150	3.107	3.069	3.036	3.008	2.984
	FW	1.079	1.085	1.099	1.112	1.125	1.136	1.146	1.155	1.163	1.170
	NP	1.880	1.748	1.662	1.587	1.524	1.470	1.422	1.380	1.344	1.312
Harvested Acres (Mil. Acres)	U.S.	3.029	2.914	2.849	2.793	2.747	2.709	2.675	2.645	2.620	2.598
	FW	0.982	0.988	1.001	1.014	1.026	1.037	1.047	1.055	1.063	1.070
	NP	1.646	1.525	1.447	1.378	1.320	1.271	1.227	1.189	1.155	1.126
Yields (Bushels/Acre)	FW	83.823	84.611	85.398	86.185	86.972	87.759	88.547	89.334	90.121	90.908
	NP	59.827	60.372	60.916	61.461	62.006	62.551	63.096	63.640	64.185	64.730
Total Supply (Mil. Bushels)	U.S.	284.788	274.534	273.141	271.431	270.334	269.861	269.438	269.252	269.313	269.547
Production (Mil. Bushels)	U.S.	190.427	204.534	203.141	201.431	200.334	199.861	199.438	199.252	199.313	199.547
Total Demand (Mil. Bushels)	U.S.	285.000	274.539	273.090	271.431	269.807	269.397	268.882	268.765	268.869	269.059
Seed (Mil. Bushels)	U.S.	5.892	5.715	5.614	5.526	5.455	5.394	5.341	5.295	5.255	5.221
Feed (Mil. Bushels)	U.S.	47.665	41.740	36.837	32.637	28.067	24.264	20.258	16.511	12.832	9.343
Food (Mil. Bushels)	U.S.	142.073	142.631	147.003	151.747	155.920	160.642	165.276	170.007	174.796	180.120
Exports (Mil. Bushels)	U.S.	29.371	24.453	23.636	21.520	20.366	19.097	18.007	16.951	15.987	14.376
Farm Price ($/Bushel)	U.S.	4.598	5.676	5.744	5.976	6.097	6.253	6.386	6.522	6.652	6.875
	FW	4.658	5.650	5.712	5.926	6.038	6.181	6.304	6.428	6.549	6.754
	NP	4.544	5.636	5.705	5.940	6.063	6.221	6.356	6.494	6.626	6.852
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	125.126	128.006	130.886	133.767	136.647	139.527	142.407	145.287	148.167	151.047
Expected Net Returns ($/Acre)	FW	364.117	274.971	359.704	366.604	386.619	398.144	412.588	425.430	438.665	451.694
	NP	226.786	156.385	221.938	226.317	240.992	248.995	259.285	268.313	277.644	286.810

Table D-9. Forecast Result for the U.S. Barley Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	3.460	3.358	3.291	3.234	3.184	3.140	3.100	3.065	3.034	3.008
	FW	1.079	1.090	1.105	1.119	1.131	1.142	1.151	1.160	1.167	1.174
	NP	1.880	1.767	1.685	1.615	1.552	1.497	1.448	1.404	1.366	1.333
Harvested Acres (Mil. Acres)	U.S.	3.029	2.935	2.876	2.824	2.779	2.739	2.703	2.671	2.644	2.620
	FW	0.982	0.992	1.007	1.020	1.032	1.043	1.052	1.060	1.067	1.074
	NP	1.646	1.542	1.468	1.403	1.346	1.295	1.250	1.210	1.175	1.145
Yields (Bushels/Acre)	FW	83.823	84.611	85.398	86.185	86.972	87.759	88.547	89.334	90.121	90.908
	NP	59.827	60.372	60.916	61.461	62.006	62.551	63.096	63.640	64.185	64.730
Total Supply (Mil. Bushels)	U.S.	284.788	275.946	274.923	273.534	272.454	271.906	271.365	271.040	270.964	271.074
Production (Mil. Bushels)	U.S.	190.427	205.946	204.923	203.534	202.454	201.906	201.365	201.040	200.964	201.074
Total Demand (Mil. Bushels)	U.S.	284.793	275.948	274.923	273.520	272.674	271.260	271.268	270.945	270.866	270.490
Seed (Mil. Bushels)	U.S.	5.892	5.748	5.655	5.574	5.503	5.441	5.385	5.335	5.291	5.254
Feed (Mil. Bushels)	U.S.	53.784	47.785	43.728	38.827	34.594	29.770	25.850	21.699	17.672	13.634
Food (Mil. Bushels)	U.S.	146.236	145.814	151.317	155.407	159.643	163.760	168.133	172.406	176.762	181.623
Exports (Mil. Bushels)	U.S.	18.881	16.601	14.224	13.712	12.934	12.289	11.900	11.504	11.141	9.979
Farm Price ($/Bushel)	U.S.	5.143	5.910	6.197	6.224	6.296	6.366	6.402	6.445	6.491	6.650
	FW	5.159	5.865	6.130	6.155	6.221	6.285	6.318	6.358	6.401	6.547
	NP	5.096	5.873	6.165	6.192	6.265	6.336	6.372	6.416	6.463	6.624
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670	9.670
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	125.126	128.006	130.886	133.767	136.647	139.527	142.407	145.287	148.167	151.047
Expected Net Returns ($/Acre)	FW	364.117	316.986	377.920	402.249	406.344	414.056	421.727	426.716	432.371	438.333
	NP	226.786	189.406	236.249	254.315	256.482	261.487	266.458	269.322	272.707	276.332

Table D-10. Forecast Result for the U.S. Barley Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	3.460	3.341	3.276	3.220	3.174	3.134	3.098	3.066	3.039	3.016
	FW	1.079	1.087	1.103	1.116	1.129	1.141	1.151	1.160	1.168	1.176
	NP	1.880	1.753	1.673	1.603	1.543	1.492	1.446	1.405	1.370	1.339
Harvested Acres (Mil. Acres)	U.S.	1.383	1.390	1.405	1.419	1.432	1.443	1.453	1.461	1.469	1.476
	FW	0.982	0.989	1.004	1.018	1.031	1.042	1.052	1.060	1.068	1.075
	NP	1.646	1.530	1.456	1.392	1.338	1.291	1.249	1.211	1.179	1.151
Yields (Bushels/Acre)	FW	83.823	84.611	85.398	86.185	86.972	87.759	88.547	89.334	90.121	90.908
	NP	59.827	60.372	60.916	61.461	62.006	62.551	63.096	63.640	64.185	64.730
Total Supply (Mil. Bushels)	U.S.	284.788	274.939	274.008	272.662	271.835	271.540	271.240	271.141	271.282	271.585
Production (Mil. Bushels)	U.S.	190.427	204.939	204.008	202.662	201.835	201.540	201.240	201.141	201.282	201.585
Total Demand (Mil. Bushels)	U.S.	284.788	275.000	273.928	272.737	271.274	271.347	271.107	271.055	271.257	271.642
Seed (Mil. Bushels)	U.S.	5.892	5.724	5.633	5.554	5.489	5.432	5.382	5.337	5.298	5.266
Feed (Mil. Bushels)	U.S.	50.928	45.714	40.878	36.985	32.400	28.942	25.079	21.420	17.803	14.478
Food (Mil. Bushels)	U.S.	142.841	143.114	147.365	152.273	156.428	161.253	165.875	170.619	175.386	180.722
Exports (Mil. Bushels)	U.S.	25.127	20.447	20.052	17.925	16.957	15.720	14.771	13.678	12.769	11.176
Farm Price ($/Bushel)	U.S.	4.308	5.366	5.391	5.635	5.740	5.896	6.014	6.157	6.283	6.505
	FW	4.390	5.364	5.387	5.612	5.709	5.853	5.961	6.093	6.209	6.413
	NP	4.249	5.322	5.347	5.595	5.701	5.860	5.979	6.124	6.252	6.477
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reference Price ($/Bushel)	U.S.	4.950	4.950	4.950	4.950	4.950	4.950	4.950	4.950	4.950	4.950
Price Loss Coverage ($/Acre)	U.S.	0.321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Agricultural Risk Coverage ($/Acre)	FW	11.341	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	125.126	128.006	130.886	133.767	136.647	139.527	142.407	145.287	148.167	151.047
Expected Net Returns ($/Acre)	FW	364.117	255.947	325.857	329.178	349.912	359.840	374.116	385.452	399.040	411.390
	NP	226.786	135.966	193.271	194.845	210.091	216.846	227.010	234.861	244.476	253.115

Table D-11. Forecast Result for the U.S. Cotton Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	9.725	10.650	11.397	11.723	11.843	11.863	11.820	11.750	11.667	11.582
	DS	0.770	1.265	1.686	1.953	2.107	2.177	2.190	2.171	2.135	2.093
	FW	0.290	0.341	0.429	0.492	0.522	0.531	0.522	0.505	0.483	0.460
	SE	2.785	2.788	2.792	2.794	2.795	2.794	2.791	2.789	2.787	2.785
	SP	5.880	6.256	6.490	6.483	6.418	6.361	6.316	6.285	6.262	6.244
Harvested Acres (Mil. Acres)	U.S.	9.038	9.640	10.184	10.512	10.685	10.753	10.748	10.704	10.642	10.573
	DS	0.738	1.227	1.644	1.908	2.060	2.130	2.143	2.123	2.088	2.047
	FW	0.286	0.337	0.424	0.487	0.517	0.526	0.517	0.500	0.478	0.455
	SE	2.714	2.717	2.721	2.723	2.723	2.722	2.720	2.718	2.716	2.714
	SP	5.301	5.359	5.395	5.394	5.384	5.375	5.368	5.364	5.360	5.357
Yields (Pounds/Acre)	DS	950.67	960.19	969.70	979.21	988.73	998.24	1,007.75	1,017.27	1,026.78	1,036.29
	FW	1,501.45	1,515.28	1,529.10	1,542.92	1,556.74	1,570.57	1,584.39	1,598.21	1,612.03	1,625.86
	SE	820.248	830.052	839.856	849.659	859.463	869.266	879.070	888.874	898.677	908.481
	SP	552.023	557.136	562.248	567.360	572.473	577.585	582.697	587.809	592.922	598.034
Total Supply (Mil. Pounds)	U.S.	9,712.21	8,410.24	9,041.59	9,474.85	9,745.60	9,904.22	9,978.24	10,007.8	10,013.7	10,010.8
Production (Mil. Pounds)	U.S.	7,282.85	6,929.24	7,560.59	7,993.85	8,264.60	8,423.22	8,497.24	8,526.81	8,532.72	8,529.78
Total Demand (Mil. Pounds)	U.S.	9,712.21	8,410.24	9,041.59	9,474.85	9,745.60	9,904.22	9,978.24	10,007.8	10,013.7	10,010.8
Milling (Mil. Pounds)	U.S.	1,607.39	843.48	996.94	1,056.41	1,038.76	967.91	856.91	724.83	581.51	434.00
Exports (Mil. Pounds)	U.S.	6,625.82	6,087.76	6,565.65	6,939.45	7,227.84	7,457.31	7,642.33	7,803.99	7,953.21	8,097.78
Farm Price ($/Pound)	U.S.	0.882	1.242	1.051	0.917	0.828	0.772	0.740	0.720	0.707	0.697
	DS	0.881	1.245	1.052	0.915	0.826	0.769	0.736	0.716	0.703	0.693
	FW	0.957	1.322	1.128	0.992	0.902	0.845	0.812	0.792	0.779	0.769
	SE	0.915	1.301	1.096	0.952	0.857	0.796	0.762	0.741	0.727	0.716
	SP	0.849	1.210	1.018	0.884	0.795	0.739	0.706	0.687	0.674	0.664
Loan Rate ($/Pound)	U.S.	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520
Loan Deficiency Payments ($/Pound)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897
Target Price ($/Pound)	U.S.	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	453.462	462.248	471.034	479.821	488.607	497.393	506.179	514.966	523.752	523.752
Expected Net Returns ($/Acre)	DS	249.473	417.823	767.242	582.707	450.454	361.968	304.072	269.688	247.729	232.401
	FW	820.751	1,017.311	1,574.341	1,287.728	1,084.025	949.614	863.582	814.680	785.392	766.569
	SE	219.869	330.916	651.534	483.345	362.589	281.702	228.752	197.352	177.352	163.441
	SP	-106.832	49.311	245.581	135.423	55.373	0.487	-36.828	-60.656	-77.359	-90.261

Table D-12. Forecast Result for the U.S. Cotton Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	9.725	10.543	11.310	11.630	11.728	11.715	11.638	11.546	11.452	11.359
	DS	0.770	1.232	1.664	1.934	2.083	2.137	2.130	2.095	2.050	2.002
	FW	0.290	0.320	0.405	0.463	0.483	0.480	0.459	0.434	0.407	0.382
	SE	2.785	2.787	2.791	2.793	2.794	2.791	2.787	2.784	2.781	2.779
	SP	5.880	6.205	6.451	6.439	6.368	6.306	6.262	6.233	6.214	6.197
Harvested Acres (Mil. Acres)	U.S.	9.038	9.576	10.131	10.457	10.613	10.652	10.613	10.546	10.469	10.391
	DS	0.738	1.194	1.622	1.889	2.037	2.090	2.083	2.048	2.004	1.956
	FW	0.286	0.316	0.400	0.459	0.478	0.475	0.454	0.429	0.402	0.377
	SE	2.714	2.715	2.719	2.722	2.722	2.720	2.716	2.713	2.710	2.708
	SP	5.301	5.351	5.389	5.388	5.377	5.367	5.360	5.356	5.353	5.350
Yields (Pounds/Acre)	DS	950.67	960.19	969.70	979.21	988.73	998.24	1,007.75	1,017.27	1,026.78	1,036.29
	FW	1,501.45	1,515.28	1,529.10	1,542.92	1,556.74	1,570.57	1,584.39	1,598.21	1,612.03	1,625.86
	SE	820.248	830.052	839.856	849.659	859.463	869.266	879.070	888.874	898.677	908.481
	SP	552.023	557.136	562.248	567.360	572.473	577.585	582.697	587.809	592.922	598.034
Total Supply (Mil. Pounds)	U.S.	9,712.21	8,341.22	8,979.43	9,407.81	9,655.68	9,777.72	9,810.45	9,809.98	9,796.20	9,780.31
Production (Mil. Pounds)	U.S.	7,282.85	6,860.22	7,498.43	7,926.81	8,174.68	8,296.72	8,329.45	8,328.98	8,315.20	8,299.31
Total Demand (Mil. Pounds)	U.S.	9,712.21	8,341.22	8,979.43	9,407.81	9,655.68	9,777.72	9,810.45	9,809.98	9,796.19	9,780.30
Milling (Mil. Pounds)	U.S.	1,792.03	995.368	1,152.09	1,209.24	1,180.73	1,092.53	961.94	815.60	662.94	509.28
Exports (Mil. Pounds)	U.S.	6,441.18	5,866.85	6,348.34	6,719.57	6,995.94	7,206.20	7,369.51	7,515.38	7,654.26	7,792.03
Farm Price ($/Pound)	U.S.	0.772	1.151	0.958	0.825	0.743	0.697	0.677	0.666	0.658	0.652
	DS	0.769	1.153	0.957	0.822	0.740	0.693	0.672	0.661	0.654	0.647
	FW	0.845	1.229	1.034	0.899	0.816	0.769	0.748	0.737	0.730	0.723
	SE	0.796	1.203	0.996	0.853	0.765	0.716	0.694	0.682	0.674	0.667
	SP	0.738	1.118	0.925	0.792	0.710	0.664	0.643	0.632	0.625	0.618
Loan Rate ($/Pound)	U.S.	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520
Loan Deficiency Payments ($/Pound)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897
Target Price ($/Pound)	U.S.	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.292	1.476	2.253	2.965
Production Costs ($/Acre)	U.S.	453.462	462.248	471.034	479.821	488.607	497.393	506.179	514.966	523.752	523.752
Expected Net Returns ($/Acre)	DS	249.473	311.094	678.566	491.232	359.464	276.618	228.435	205.336	191.586	181.567
	FW	820.751	848.587	1,434.266	1,143.346	940.516	815.103	744.466	713.410	697.103	686.684
	SE	219.869	233.342	570.307	399.397	278.932	203.090	158.963	137.873	125.373	116.298
	SP	-106.832	-11.971	194.702	82.977	3.241	-48.378	-80.103	-97.157	-107.962	-117.035

Table D-13. Forecast Result for the U.S. Cotton Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	9.725	10.732	11.468	11.800	11.937	11.983	11.967	11.919	11.853	11.780
	DS	0.770	1.285	1.700	1.965	2.124	2.204	2.232	2.226	2.201	2.167
	FW	0.290	0.356	0.447	0.516	0.554	0.574	0.576	0.568	0.553	0.535
	SE	2.785	2.789	2.793	2.795	2.796	2.796	2.794	2.793	2.791	2.790
	SP	5.880	6.302	6.528	6.524	6.463	6.409	6.365	6.333	6.308	6.289
Harvested Acres (Mil. Acres)	U.S.	9.038	9.683	10.223	10.555	10.741	10.832	10.852	10.832	10.787	10.731
	DS	0.738	1.247	1.658	1.920	2.077	2.156	2.184	2.178	2.153	2.119
	FW	0.286	0.352	0.442	0.511	0.549	0.568	0.570	0.562	0.547	0.530
	SE	2.714	2.717	2.721	2.723	2.724	2.724	2.722	2.721	2.720	2.718
	SP	5.301	5.366	5.401	5.401	5.391	5.383	5.376	5.371	5.367	5.364
Yields (Pounds/Acre)	DS	950.673	960.187	969.700	979.214	988.727	998.240	1,007.75	1,017.27	1,026.78	1,036.29
	FW	1,501.45	1,515.28	1,529.10	1,542.92	1,556.74	1,570.57	1,584.39	1,598.21	1,612.03	1,625.86
	SE	820.248	830.052	839.856	849.659	859.463	869.266	879.070	888.874	898.677	908.481
	SP	552.023	557.136	562.248	567.360	572.473	577.585	582.697	587.809	592.922	598.034
Total Supply (Mil. Pounds)	U.S.	9,712.21	8,457.20	9,087.41	9,527.14	9,816.59	10,003.2	10,110.9	10,170.7	10,200.7	10,215.3
Production (Mil. Pounds)	U.S.	7,282.85	6,976.20	7,606.41	8,046.14	8,335.58	8,522.16	8,629.87	8,689.71	8,719.74	8,734.25
Total Demand (Mil. Pounds)	U.S.	9,712.21	8,457.20	9,087.41	9,527.14	9,816.59	10,003.2	10,110.9	10,170.7	10,200.7	10,215.3
Milling (Mil. Pounds)	U.S.	1,422.75	681.12	834.04	896.58	887.80	830.22	735.20	617.48	485.61	346.38
Exports (Mil. Pounds)	U.S.	6,810.46	6,297.08	6,774.37	7,151.57	7,449.78	7,693.96	7,896.66	8,074.23	8,236.13	8,389.87
Farm Price ($/Pound)	U.S.	0.993	1.339	1.149	1.012	0.919	0.855	0.813	0.785	0.765	0.750
	DS	0.993	1.344	1.151	1.013	0.918	0.853	0.810	0.782	0.762	0.746
	FW	1.069	1.420	1.227	1.089	0.994	0.929	0.886	0.858	0.838	0.822
	SE	1.034	1.406	1.201	1.055	0.954	0.885	0.840	0.810	0.789	0.772
	SP	0.960	1.307	1.116	0.980	0.886	0.821	0.780	0.751	0.732	0.716
Loan Rate ($/Pound)	U.S.	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520
Loan Deficiency Payments ($/Pound)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897
Target Price ($/Pound)	U.S.	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	453.462	462.248	471.034	479.821	488.607	497.393	506.179	514.966	523.752	523.752
Expected Net Returns ($/Acre)	DS	249.473	524.552	862.030	678.753	545.615	452.720	387.642	344.265	314.126	292.271
	FW	820.75	1,186.04	1,724.07	1,439.33	1,234.11	1,092.64	995.19	932.04	889.81	860.65
	SE	219.869	428.490	738.357	571.486	450.079	365.290	305.861	266.282	238.826	218.964
	SP	-106.832	110.593	299.966	190.490	109.893	52.445	10.986	-18.016	-39.422	-56.075

Table D-14. Forecast Result for the U.S. Cotton Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	9.725	10.576	11.277	11.572	11.701	11.733	11.713	11.667	11.608	11.542
	DS	0.770	1.265	1.681	1.944	2.095	2.169	2.192	2.184	2.160	2.124
	FW	0.290	0.282	0.351	0.383	0.395	0.389	0.377	0.362	0.350	0.341
	SE	2.785	2.788	2.792	2.795	2.796	2.796	2.794	2.793	2.792	2.791
	SP	5.880	6.242	6.453	6.450	6.415	6.379	6.350	6.327	6.306	6.286
Harvested Acres (Mil. Acres)	U.S.	9.038	9.578	10.096	10.390	10.546	10.608	10.613	10.586	10.545	10.497
	DS	0.738	1.227	1.638	1.899	2.048	2.122	2.144	2.137	2.112	2.077
	FW	0.286	0.278	0.347	0.378	0.390	0.385	0.372	0.358	0.345	0.336
	SE	2.714	2.717	2.721	2.723	2.724	2.724	2.722	2.721	2.720	2.719
	SP	5.301	5.357	5.390	5.389	5.384	5.378	5.374	5.370	5.367	5.364
Yields (Pounds/Acre)	DS	950.67	960.19	969.70	979.21	988.73	998.24	1,007.75	1,017.27	1,026.78	1,036.29
	FW	1,501.45	1,515.28	1,529.10	1,542.92	1,556.74	1,570.57	1,584.39	1,598.21	1,612.03	1,625.86
	SE	820.248	830.052	839.856	849.659	859.463	869.266	879.070	888.874	898.677	908.481
	SP	552.023	557.136	562.248	567.360	572.473	577.585	582.697	587.809	592.922	598.034
Total Supply (Mil. Pounds)	U.S.	9,712.21	8,319.52	8,915.83	9,295.80	9,536.97	9,677.10	9,756.41	9,802.26	9,833.40	9,858.56
Production (Mil. Pounds)	U.S.	7,282.85	6,838.52	7,434.83	7,814.80	8,055.97	8,196.10	8,275.41	8,321.26	8,352.40	8,377.56
Total Demand (Mil. Pounds)	U.S.	9,712.21	8,319.52	8,915.83	9,295.80	9,536.97	9,677.10	9,756.41	9,802.27	9,833.40	9,858.55
Milling (Mil. Pounds)	U.S.	1,607.39	800.429	937.263	971.445	939.763	860.136	751.652	627.293	495.950	361.765
Exports (Mil. Pounds)	U.S.	6,625.82	6,040.09	6,499.56	6,845.35	7,118.21	7,337.96	7,525.76	7,695.97	7,858.45	8,017.79
Farm Price ($/Pound)	U.S.	0.882	1.268	1.087	0.968	0.888	0.837	0.803	0.779	0.759	0.740
	DS	0.881	1.271	1.088	0.967	0.886	0.834	0.800	0.776	0.755	0.737
	FW	0.957	1.348	1.164	1.043	0.962	0.911	0.876	0.852	0.831	0.813
	SE	0.915	1.329	1.134	1.006	0.921	0.866	0.830	0.804	0.782	0.762
	SP	0.849	1.236	1.054	0.935	0.855	0.804	0.770	0.745	0.725	0.707
Loan Rate ($/Pound)	U.S.	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520
Loan Deficiency Payments ($/Pound)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897	33.897
Target Price ($/Pound)	U.S.	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713	0.713
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	453.462	462.248	471.034	479.821	488.607	497.393	506.179	514.966	523.752	523.752
Expected Net Returns ($/Acre)	DS	249.473	417.823	792.374	617.892	501.040	421.481	369.485	334.186	308.055	285.818
	FW	820.751	1,017.31	1,614.04	1,343.26	1,163.81	1,043.41	966.597	916.181	880.260	850.513
	SE	219.869	330.916	674.553	515.634	409.097	336.517	289.108	256.967	233.206	212.979
	SP	-106.832	49.311	260.000	155.596	84.355	34.560	0.597	-23.779	-42.890	-59.760

Table D-15. Forecast Result for the U.S. Cotton Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	9.725	10.656	11.395	11.703	11.813	11.832	11.789	11.718	11.634	11.547
	DS	0.770	1.268	1.691	1.959	2.115	2.185	2.198	2.176	2.139	2.095
	FW	0.290	0.346	0.436	0.503	0.534	0.547	0.539	0.524	0.503	0.482
	SE	2.785	2.788	2.792	2.795	2.796	2.795	2.792	2.790	2.788	2.786
	SP	5.880	6.253	6.476	6.447	6.368	6.306	6.260	6.227	6.204	6.184
Harvested Acres (Mil. Acres)	U.S.	9.038	9.648	10.194	10.523	10.697	10.769	10.764	10.721	10.658	10.588
	DS	0.738	1.231	1.649	1.914	2.068	2.137	2.150	2.129	2.092	2.048
	FW	0.286	0.342	0.431	0.497	0.529	0.542	0.534	0.519	0.498	0.477
	SE	2.714	2.717	2.721	2.723	2.724	2.723	2.721	2.719	2.717	2.715
	SP	5.301	5.359	5.393	5.389	5.376	5.367	5.360	5.355	5.351	5.348
Yields (Pounds/Acre)	DS	950.673	960.187	969.700	979.214	988.727	998.240	1,007.75	1,017.27	1,026.78	1,036.29
	FW	1,501.45	1,515.28	1,529.10	1,542.92	1,556.74	1,570.57	1,584.39	1,598.21	1,612.03	1,625.86
	SE	820.248	830.052	839.856	849.659	859.463	869.266	879.070	888.874	898.677	908.481
	SP	552.023	557.136	562.248	567.360	572.473	577.585	582.697	587.809	592.922	598.034
Total Supply (Mil. Pounds)	U.S.	9712.21	8421.42	9055.95	9493.47	9768.23	9932.09	10008.65	10040.00	10046.17	10043.60
Production (Mil. Pounds)	U.S.	7282.852	6940.423	7574.954	8012.472	8287.233	8451.085	8527.646	8559.004	8565.165	8562.597
Total Demand (Mil. Pounds)	U.S.	9712.21	8421.42	9055.95	9493.47	9768.23	9932.08	10008.65	10040.00	10046.17	10043.60
Milling (Mil. Pounds)	U.S.	1607.391	848.785	1003.755	1065.242	1049.500	981.129	871.341	740.102	596.909	449.569
Exports (Mil. Pounds)	U.S.	6625.821	6093.639	6573.199	6949.230	7239.733	7471.953	7658.306	7820.902	7970.260	8115.026
Farm Price ($/Pound)	U.S.	0.882	1.239	1.047	0.911	0.822	0.764	0.731	0.711	0.698	0.688
	DS	0.881	1.242	1.048	0.910	0.819	0.761	0.727	0.707	0.694	0.683
	FW	0.957	1.318	1.124	0.986	0.896	0.837	0.803	0.783	0.770	0.759
	SE	0.915	1.298	1.092	0.946	0.850	0.788	0.752	0.731	0.717	0.706
	SP	0.849	1.206	1.014	0.878	0.789	0.731	0.698	0.678	0.665	0.654
Loan Rate ($/Pound)	U.S.	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520	0.520
Loan Deficiency Payments ($/Pound)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reference Price ($/Pound)	U.S.	-	-	-	-	-	-	-	-	-	-
Production Costs ($/Acre)	U.S.	453.462	462.248	471.034	479.821	488.607	497.393	506.179	514.966	523.752	523.752
Expected Net Returns ($/Acre)	DS	249.473	417.823	764.143	578.689	445.195	355.511	296.048	260.848	238.280	222.789
	FW	820.751	1017.311	1569.446	1281.385	1075.730	939.438	850.945	800.769	770.533	751.463
	SE	219.869	330.916	648.695	479.657	357.753	275.755	221.348	189.181	168.605	154.526
	SP	-106.832	49.311	243.803	133.119	52.359	-3.210	-41.419	-65.710	-82.758	-95.750

Table D-16. Forecast Result for the U.S. Oats Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	2.932	3.205	3.227	3.270	3.327	3.198	3.236	3.228	3.212	3.187
	FW	0.417	0.365	0.327	0.301	0.272	0.244	0.214	0.186	0.155	0.124
	LS	0.520	0.543	0.562	0.577	0.586	0.592	0.595	0.596	0.596	0.594
	NP	0.575	0.597	0.616	0.632	0.646	0.659	0.669	0.679	0.687	0.694
	SP	0.550	0.556	0.563	0.571	0.577	0.582	0.586	0.590	0.593	0.595
Harvested Acres (Mil. Acres)	U.S.	1.724	1.727	1.733	1.741	1.743	1.742	1.736	1.730	1.720	1.709
	FW	0.209	0.182	0.164	0.150	0.136	0.122	0.107	0.093	0.078	0.062
	LS	0.402	0.415	0.427	0.436	0.441	0.445	0.446	0.447	0.447	0.446
	NP	0.361	0.374	0.386	0.396	0.405	0.413	0.420	0.426	0.431	0.435
	SP	0.083	0.085	0.087	0.089	0.091	0.092	0.093	0.094	0.095	0.096
Yields (Bushels/Acre)	FW	82.049	82.141	82.232	82.324	82.416	82.508	82.600	82.691	82.783	82.875
	LS	64.275	64.492	64.710	64.928	65.146	65.364	65.582	65.800	66.018	66.236
	NP	64.952	65.492	66.033	66.574	67.115	67.656	68.196	68.737	69.278	69.819
	SP	45.010	45.116	45.222	45.328	45.435	45.541	45.647	45.753	45.859	45.966
Total Supply (Mil. Bushels)	U.S.	242.894	247.987	249.005	250.101	250.779	251.233	251.357	251.424	251.260	250.954
Production (Mil. Bushels)	U.S.	72.130	102.987	104.005	105.101	105.779	106.233	106.357	106.424	106.260	105.954
Total Demand (Mil. Bushels)	U.S.	242.895	247.911	249.009	249.734	250.456	251.657	251.550	251.807	251.576	250.820
Seed (Mil. Bushels)	U.S.	7.994	8.506	8.547	8.627	8.735	8.494	8.564	8.549	8.519	8.472
Feed (Mil. Bushels)	U.S.	106.634	118.265	119.619	120.380	120.651	121.135	120.349	119.988	119.287	118.156
Food (Mil. Bushels)	U.S.	79.853	72.794	72.443	72.278	72.545	73.434	73.984	74.549	74.983	75.363
Exports (Mil. Bushels)	U.S.	3.414	3.345	3.400	3.449	3.524	3.595	3.653	3.721	3.786	3.829
Farm Price ($/Bushel)	U.S.	2.079	2.322	2.303	2.295	2.233	2.181	2.155	2.107	2.066	2.072
	FW	2.278	2.491	2.474	2.468	2.413	2.368	2.345	2.303	2.268	2.273
	LS	1.987	2.212	2.194	2.187	2.129	2.081	2.057	2.013	1.976	1.981
	NP	1.984	2.211	2.193	2.186	2.128	2.079	2.055	2.010	1.972	1.978
	SP	2.923	3.287	3.258	3.246	3.153	3.075	3.037	2.965	2.905	2.914
Loan Rate ($/Bushel)	U.S.	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390
Loan Deficiency Payments ($/Bushel)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985
Target Price ($/Bushel)	U.S.	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790
Counter-cyclical Payments ($/Acre)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	88.817	90.817	92.816	94.815	96.814	98.814	100.813	102.812	104.811	106.811
Expected Net Returns ($/Acre)	FW	214.604	99.109	114.801	111.653	109.321	103.068	97.522	93.884	88.639	83.906
	LS	117.585	39.877	52.805	50.143	48.155	42.893	38.206	35.104	30.645	26.604
	NP	105.250	41.007	54.971	52.986	51.688	46.974	42.825	40.313	36.352	32.806
	SP	138.793	43.722	58.445	55.500	53.320	47.444	42.225	38.799	33.849	29.376

Table D-17. Forecast Result for the U.S. Oats Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	2.932	3.205	2.932	3.197	3.215	3.257	3.313	3.185	3.223	3.214
	FW	0.417	0.365	0.417	0.359	0.320	0.293	0.264	0.237	0.206	0.178
	LS	0.520	0.543	0.520	0.541	0.560	0.574	0.583	0.589	0.591	0.592
	NP	0.575	0.597	0.575	0.597	0.616	0.632	0.647	0.659	0.670	0.679
	SP	0.550	0.556	0.550	0.555	0.562	0.568	0.574	0.579	0.583	0.587
Harvested Acres (Mil. Acres)	U.S.	1.724	1.307	1.724	1.723	1.728	1.735	1.736	1.736	1.730	1.723
	FW	0.209	0.068	0.209	0.180	0.160	0.147	0.132	0.118	0.103	0.089
	LS	0.402	0.300	0.402	0.414	0.425	0.434	0.439	0.443	0.444	0.445
	NP	0.361	0.184	0.361	0.374	0.386	0.397	0.405	0.413	0.420	0.426
	SP	0.083	0.085	0.083	0.084	0.086	0.088	0.090	0.091	0.093	0.094
Yields (Bushels/Acre)	FW	82.049	88.919	82.049	82.141	82.232	82.324	82.416	82.508	82.600	82.691
	LS	64.275	64.057	64.275	64.492	64.710	64.928	65.146	65.364	65.582	65.800
	NP	64.952	64.411	64.952	65.492	66.033	66.574	67.115	67.656	68.196	68.737
	SP	45.010	44.904	45.010	45.116	45.222	45.328	45.435	45.541	45.647	45.753
Total Supply (Mil. Bushels)	U.S.	242.894	212.000	242.894	247.734	248.656	249.735	250.371	250.856	250.986	251.023
Production (Mil. Bushels)	U.S.	72.130	64.024	72.130	102.734	103.656	104.735	105.371	105.856	105.986	106.023
Total Demand (Mil. Bushels)	U.S.	242.895	177.000	242.894	247.590	248.662	249.693	250.054	251.123	251.183	251.247
Seed (Mil. Bushels)	U.S.	7.994	8.800	7.994	8.491	8.525	8.604	8.709	8.469	8.539	8.522
Feed (Mil. Bushels)	U.S.	106.634	100.000	108.590	120.443	121.584	122.300	122.067	122.336	121.606	121.088
Food (Mil. Bushels)	U.S.	79.853	68.000	78.227	70.640	70.481	70.668	71.088	72.059	72.719	73.254
Exports (Mil. Bushels)	U.S.	3.414	1.200	3.083	3.016	3.071	3.121	3.190	3.258	3.318	3.383
Farm Price ($/Bushel)	U.S.	2.079	3.850	1.963	2.202	2.182	2.174	2.125	2.078	2.047	2.008
	FW	2.278	3.776	2.178	2.387	2.369	2.362	2.319	2.278	2.251	2.217
	LS	1.987	3.727	1.881	2.101	2.083	2.075	2.030	1.987	1.958	1.922
	NP	1.984	3.515	1.876	2.099	2.080	2.073	2.027	1.984	1.955	1.918
	SP	2.923	5.789	2.751	3.108	3.078	3.065	2.993	2.923	2.876	2.817
Loan Rate ($/Bushel)	U.S.	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390
Loan Deficiency Payments ($/Bushel)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	0.985	0.966	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985
Target Price ($/Bushel)	U.S.	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790
Counter-cyclical Payments ($/Acre)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	88.817	122.120	88.817	90.817	92.816	94.815	96.814	98.814	100.813	102.812
Expected Net Returns ($/Acre)	FW	214.604	99.109	214.604	90.850	106.199	102.974	100.606	95.316	90.155	86.129
	LS	117.585	39.877	117.585	33.045	45.673	42.931	40.898	36.423	32.043	28.602
	NP	105.250	41.007	105.250	34.022	47.644	45.541	44.160	40.230	36.371	33.473
	SP	138.793	43.722	138.793	35.978	50.369	47.343	45.119	40.140	35.274	31.474

Table D-18. Forecast Result for the U.S. Oats Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	2.932	3.212	3.237	3.279	3.336	3.209	3.247	3.240	3.225	3.203
	FW	0.417	0.369	0.333	0.306	0.277	0.250	0.220	0.193	0.163	0.134
	LS	0.520	0.544	0.564	0.579	0.589	0.595	0.598	0.599	0.599	0.598
	NP	0.575	0.597	0.616	0.632	0.646	0.658	0.669	0.678	0.687	0.694
	SP	0.550	0.557	0.565	0.572	0.578	0.584	0.588	0.592	0.596	0.598
Harvested Acres (Mil. Acres)	U.S.	1.724	1.730	1.738	1.746	1.748	1.747	1.741	1.736	1.727	1.717
	FW	0.209	0.185	0.167	0.153	0.139	0.125	0.110	0.096	0.081	0.067
	LS	0.402	0.416	0.428	0.437	0.443	0.446	0.448	0.449	0.449	0.448
	NP	0.361	0.374	0.386	0.396	0.405	0.413	0.419	0.425	0.430	0.435
	SP	0.083	0.085	0.087	0.089	0.091	0.093	0.094	0.095	0.096	0.097
Yields (Bushels/Acre)	FW	82.049	82.141	82.232	82.324	82.416	82.508	82.600	82.691	82.783	82.875
	LS	64.275	64.492	64.710	64.928	65.146	65.364	65.582	65.800	66.018	66.236
	NP	64.952	65.492	66.033	66.574	67.115	67.656	68.196	68.737	69.278	69.819
	SP	45.010	45.116	45.222	45.328	45.435	45.541	45.647	45.753	45.859	45.966
Total Supply (Mil. Bushels)	U.S.	242.894	248.187	249.308	250.371	251.059	251.543	251.667	251.786	251.632	251.411
Production (Mil. Bushels)	U.S.	72.130	103.187	104.308	105.371	106.059	106.543	106.667	106.786	106.632	106.411
Total Demand (Mil. Bushels)	U.S.	242.905	248.187	249.950	250.371	250.699	252.235	251.796	252.461	251.935	251.338
Seed (Mil. Bushels)	U.S.	7.994	8.519	8.566	8.644	8.753	8.514	8.584	8.572	8.543	8.502
Feed (Mil. Bushels)	U.S.	104.795	116.025	117.990	118.794	118.995	119.826	118.893	118.856	118.000	117.016
Food (Mil. Bushels)	U.S.	81.369	74.970	74.659	74.151	74.097	74.963	75.334	75.972	76.271	76.653
Exports (Mil. Bushels)	U.S.	3.747	3.674	3.735	3.783	3.855	3.932	3.985	4.060	4.121	4.167
Farm Price ($/Bushel)	U.S.	2.189	2.441	2.408	2.404	2.349	2.282	2.267	2.204	2.173	2.172
	FW	2.375	2.595	2.567	2.563	2.515	2.456	2.443	2.388	2.361	2.360
	LS	2.089	2.321	2.291	2.287	2.237	2.175	2.160	2.103	2.074	2.073
	NP	2.086	2.322	2.291	2.287	2.236	2.174	2.159	2.101	2.071	2.071
	SP	3.087	3.464	3.415	3.409	3.327	3.227	3.204	3.111	3.063	3.062
Loan Rate ($/Bushel)	U.S.	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390
Loan Deficiency Payments ($/Bushel)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985
Target Price ($/Bushel)	U.S.	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790
Counter-cyclical Payments ($/Acre)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	88.817	90.817	92.816	94.815	96.814	98.814	100.813	102.812	104.811	106.811
Expected Net Returns ($/Acre)	FW	214.604	107.007	123.327	119.221	117.152	111.434	104.839	101.939	95.664	91.589
	LS	117.585	46.411	59.873	56.431	54.677	49.876	44.326	41.857	36.547	33.074
	NP	105.250	47.686	62.233	59.478	58.454	54.252	49.234	47.417	42.590	39.675
	SP	138.793	51.128	66.449	62.614	60.690	55.327	49.128	46.407	40.493	36.651

Table D-19. Forecast Result for the U.S. Oats Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	2.932	3.181	3.199	3.232	3.289	3.158	3.203	3.199	3.191	3.173
	FW	0.417	0.343	0.301	0.265	0.236	0.205	0.181	0.156	0.132	0.107
	LS	0.520	0.542	0.561	0.575	0.585	0.591	0.595	0.597	0.597	0.596
	NP	0.575	0.597	0.616	0.633	0.647	0.659	0.670	0.679	0.687	0.694
	SP	0.550	0.556	0.563	0.569	0.576	0.581	0.586	0.590	0.594	0.596
Harvested Acres (Mil. Acres)	U.S.	1.724	1.715	1.719	1.722	1.724	1.722	1.720	1.716	1.710	1.702
	FW	0.209	0.171	0.151	0.133	0.118	0.103	0.090	0.078	0.066	0.053
	LS	0.402	0.415	0.426	0.434	0.440	0.444	0.446	0.448	0.448	0.447
	NP	0.361	0.375	0.386	0.397	0.406	0.413	0.420	0.426	0.431	0.435
	SP	0.083	0.085	0.087	0.089	0.090	0.092	0.093	0.094	0.095	0.096
Yields (Bushels/Acre)	FW	82.049	82.141	82.232	82.324	82.416	82.508	82.600	82.691	82.783	82.875
	LS	64.275	64.492	64.710	64.928	65.146	65.364	65.582	65.800	66.018	66.236
	NP	64.952	65.492	66.033	66.574	67.115	67.656	68.196	68.737	69.278	69.819
	SP	45.010	45.116	45.222	45.328	45.435	45.541	45.647	45.753	45.859	45.966
Total Supply (Mil. Bushels)	U.S.	242.894	247.140	248.031	248.781	249.441	249.814	250.190	250.407	250.491	250.422
Production (Mil. Bushels)	U.S.	72.130	102.140	103.031	103.781	104.441	104.814	105.190	105.407	105.491	105.422
Total Demand (Mil. Bushels)	U.S.	242.895	247.141	248.031	248.535	249.840	249.484	250.038	250.264	250.392	251.056
Seed (Mil. Bushels)	U.S.	7.994	8.461	8.495	8.556	8.663	8.417	8.502	8.496	8.480	8.447
Feed (Mil. Bushels)	U.S.	108.870	117.983	119.147	119.024	119.705	118.851	118.480	118.061	117.614	117.551
Food (Mil. Bushels)	U.S.	77.749	72.474	72.151	72.634	73.062	73.734	74.491	75.057	75.564	76.250
Exports (Mil. Bushels)	U.S.	3.281	3.223	3.238	3.320	3.410	3.482	3.566	3.650	3.735	3.809
Farm Price ($/Bushel)	U.S.	2.360	2.579	2.644	2.568	2.474	2.420	2.339	2.258	2.175	2.115
	FW	2.524	2.716	2.772	2.706	2.624	2.577	2.506	2.435	2.363	2.310
	LS	2.246	2.449	2.508	2.438	2.351	2.302	2.227	2.152	2.076	2.021
	NP	2.246	2.451	2.511	2.440	2.352	2.302	2.227	2.151	2.074	2.018
	SP	3.343	3.670	3.767	3.653	3.513	3.433	3.312	3.191	3.067	2.977
Loan Rate ($/Bushel)	U.S.	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390
Loan Deficiency Payments ($/Bushel)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985
Target Price ($/Bushel)	U.S.	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790	1.790
Counter-cyclical Payments ($/Acre)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	88.817	90.817	92.816	94.815	96.814	98.814	100.813	102.812	104.811	106.811
Expected Net Returns ($/Acre)	FW	214.604	119.269	133.237	136.140	128.903	120.396	114.787	107.185	99.534	91.790
	LS	117.585	56.553	68.089	70.489	64.463	57.356	52.648	46.255	39.799	33.243
	NP	105.250	58.055	70.673	73.991	68.606	62.048	57.948	52.044	46.026	39.855
	SP	138.793	62.624	75.753	78.517	71.749	63.771	58.512	51.363	44.153	36.841

Table D-20. Forecast Result for the U.S. Oats Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	2.932	3.220	3.247	3.291	3.344	3.214	3.251	3.244	3.231	3.209
	FW	0.417	0.376	0.344	0.318	0.284	0.255	0.223	0.196	0.167	0.138
	LS	0.520	0.545	0.563	0.577	0.586	0.592	0.595	0.596	0.596	0.594
	NP	0.575	0.597	0.616	0.632	0.646	0.658	0.669	0.679	0.687	0.694
	SP	0.550	0.558	0.567	0.575	0.582	0.587	0.592	0.597	0.600	0.604
Harvested Acres (Mil. Acres)	U.S.	1.715	1.726	1.735	1.744	1.744	1.743	1.738	1.732	1.725	1.715
	FW	0.199	0.180	0.164	0.152	0.136	0.122	0.107	0.094	0.080	0.066
	LS	0.402	0.417	0.427	0.436	0.441	0.445	0.446	0.447	0.447	0.446
	NP	0.361	0.374	0.386	0.396	0.405	0.413	0.420	0.425	0.431	0.435
	SP	0.083	0.085	0.088	0.090	0.092	0.094	0.095	0.096	0.097	0.098
Yields (Bushels/Acre)	FW	82.049	82.141	82.232	82.324	82.416	82.508	82.600	82.691	82.783	82.875
	LS	64.275	64.492	64.710	64.928	65.146	65.364	65.582	65.800	66.018	66.236
	NP	64.952	65.492	66.033	66.574	67.115	67.656	68.196	68.737	69.278	69.819
	SP	45.010	45.116	45.222	45.328	45.435	45.541	45.647	45.753	45.859	45.966
Total Supply (Mil. Bushels)	U.S.	253.588	259.040	260.116	261.138	261.541	261.840	261.852	261.857	261.673	261.386
Production (Mil. Bushels)	U.S.	82.824	114.040	115.116	116.138	116.541	116.840	116.852	116.857	116.673	116.386
Total Demand (Mil. Bushels)	U.S.	253.589	259.005	260.122	260.896	261.222	262.264	262.088	262.246	262.038	261.206
Seed (Mil. Bushels)	U.S.	7.994	8.535	8.586	8.668	8.767	8.523	8.593	8.580	8.554	8.515
Feed (Mil. Bushels)	U.S.	115.390	128.480	129.853	130.643	130.508	130.788	129.879	129.422	128.704	127.516
Food (Mil. Bushels)	U.S.	81.727	73.605	73.245	73.100	73.388	74.327	74.930	75.492	75.961	76.315
Exports (Mil. Bushels)	U.S.	3.478	3.386	3.438	3.485	3.558	3.627	3.686	3.753	3.819	3.861
Farm Price ($/Bushel)	U.S.	1.943	2.236	2.222	2.218	2.161	2.113	2.085	2.040	1.997	2.006
	FW	2.160	2.416	2.404	2.401	2.351	2.308	2.284	2.244	2.207	2.215
	LS	1.862	2.132	2.120	2.116	2.063	2.019	1.993	1.951	1.911	1.920
	NP	1.857	2.130	2.118	2.114	2.061	2.016	1.989	1.947	1.907	1.916
	SP	2.720	3.158	3.138	3.132	3.046	2.974	2.932	2.865	2.801	2.814
Loan Rate ($/Bushel)	U.S.	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390	1.390
Loan Deficiency Payments ($/Bushel)	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reference Price ($/Bushel)	U.S.	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400
Price Loss Coverage ($/Bushel)	U.S.	0.229	0.082	0.089	0.091	0.119	0.144	0.158	0.180	0.202	0.197
Agricultural Risk Coverage ($/Acre)	FW	24.105	22.358	8.753	0.987	0.000	0.000	0.000	0.000	0.000	0.000
	LS	15.190	0.000	4.520	0.823	0.000	0.000	0.000	0.000	0.000	0.000
	NP	15.573	5.513	7.755	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	17.473	17.562	16.264	9.464	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	88.817	90.817	92.816	94.815	96.814	98.814	100.813	102.812	104.811	106.811
Expected Net Returns ($/Acre)	FW	214.604	104.287	118.802	110.801	105.687	100.170	95.565	92.136	87.698	83.385
	LS	117.585	42.131	48.549	48.174	44.967	40.308	36.397	33.459	29.664	25.964
	NP	105.250	43.222	52.775	52.151	47.994	44.200	40.815	38.438	35.128	31.893
	SP	138.793	44.913	60.210	57.247	52.631	43.831	39.325	35.993	31.642	27.410

Table D-21. Forecast Result for the U.S. LG Rice Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	1.788	2.686	2.835	2.798	2.768	2.784	2.826	2.818	2.813	2.815
	DS	1.480	1.912	2.089	2.098	2.104	2.109	2.114	2.119	2.123	2.127
Harvested Acres (Mil. Acres)	U.S.	1.744	2.627	2.781	2.746	2.718	2.734	2.774	2.766	2.762	2.764
	DS	1.452	1.891	2.072	2.081	2.087	2.093	2.097	2.102	2.106	2.111
Yields (Cwt/Acre)	DS	69.951	70.738	71.525	72.311	73.098	73.885	74.671	75.458	76.245	77.032
Total Supply (Mil. Cwt)	U.S.	182.943	188.785	203.209	205.467	207.573	209.621	211.623	213.612	215.602	217.600
Production (Mil. Cwt)	U.S.	143.537	145.785	160.209	162.467	164.573	166.621	168.623	170.612	172.602	174.600
Total Demand (Mil. Cwt)	U.S.	185.775	188.623	205.129	207.444	209.753	212.117	214.477	216.837	219.196	221.556
Domestic and Residual (Mil. Cwt)	U.S.	88.706	90.463	98.098	99.585	101.066	102.560	104.053	105.548	107.045	108.545
Exports (Mil. Cwt)	U.S.	69.069	70.160	79.032	79.859	80.687	81.557	82.424	83.289	84.151	85.011
Farm Price ($/Cwt)	U.S.	18.118	18.056	15.450	15.475	15.500	15.510	15.522	15.535	15.548	15.562
	DS	18.095	18.034	15.433	15.458	15.482	15.493	15.504	15.517	15.530	15.544
Loan Rate ($/Cwt)	U.S.	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
Loan Deficiency Payments ($/Cwt)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246
Target Price ($/Cwt)	U.S.	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.528	451.618	457.707	463.796	469.885	475.974	482.063	488.152	494.241	500.330
Expected Net Returns ($/Acre)	DS	540.256	916.476	920.288	742.377	750.221	758.078	764.946	771.925	778.981	786.121

Table D-22. Forecast Result for the U.S. LG Rice Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	1.788	2.681	2.827	2.792	2.762	2.779	2.820	2.812	2.807	2.809
	DS	1.480	1.906	2.082	2.092	2.098	2.104	2.108	2.113	2.117	2.121
Harvested Acres (Mil. Acres)	U.S.	1.744	2.621	2.773	2.740	2.712	2.728	2.768	2.760	2.756	2.758
	DS	1.452	1.886	2.064	2.075	2.081	2.087	2.092	2.096	2.100	2.105
Yields (Cwt/Acre)	DS	69.951	70.738	71.525	72.311	73.098	73.885	74.671	75.458	76.245	77.032
Total Supply (Mil. Cwt)	U.S.	182.943	188.383	202.655	205.012	207.148	209.198	211.192	213.168	215.144	217.126
Production (Mil. Cwt)	U.S.	143.537	145.383	159.655	162.012	164.148	166.198	168.192	170.168	172.144	174.126
Total Demand (Mil. Cwt)	U.S.	185.604	188.372	204.437	206.766	209.087	211.459	213.827	216.195	218.560	220.925
Domestic and Residual (Mil. Cwt)	U.S.	89.003	90.720	98.188	99.680	101.165	102.661	104.157	105.654	107.152	108.653
Exports (Mil. Cwt)	U.S.	68.601	69.652	78.250	79.086	79.922	80.798	81.671	82.541	83.408	84.271
Farm Price ($/Cwt)	U.S.	17.895	17.847	15.331	15.352	15.374	15.383	15.393	15.404	15.416	15.428
	DS	17.873	17.824	15.313	15.335	15.357	15.366	15.376	15.386	15.398	15.411
Loan Rate ($/Cwt)	U.S.	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
Loan Deficiency Payments ($/Cwt)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246
Target Price ($/Cwt)	U.S.	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.528	451.618	457.707	463.796	469.885	475.974	482.063	488.152	494.241	500.330
Expected Net Returns ($/Acre)	DS	540.256	900.939	905.494	733.817	741.342	748.926	755.557	762.298	769.115	776.033

Table D-23. Forecast Result for the U.S. LG rice Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	1.788	2.692	2.822	2.844	2.792	2.800	2.838	2.829	2.824	2.826
	DS	1.480	1.917	2.077	2.144	2.128	2.125	2.126	2.130	2.134	2.138
Harvested Acres (Mil. Acres)	U.S.	1.744	2.633	2.768	2.793	2.742	2.749	2.786	2.778	2.773	2.776
	DS	1.452	1.897	2.059	2.128	2.112	2.108	2.110	2.113	2.118	2.122
Yields (Cwt/Acre)	DS	69.951	70.738	71.525	72.311	73.098	73.885	74.671	75.458	76.245	77.032
Total Supply (Mil. Cwt)	U.S.	182.943	189.192	202.302	208.853	209.364	210.776	212.540	214.460	216.452	218.480
Production (Mil. Cwt)	U.S.	143.537	146.192	159.302	165.853	166.364	167.776	169.540	171.460	173.452	175.480
Total Demand (Mil. Cwt)	U.S.	185.947	194.817	197.409	209.170	211.414	213.726	216.023	218.319	220.617	222.921
Domestic and Residual (Mil. Cwt)	U.S.	88.418	93.732	95.314	100.788	102.224	103.688	105.148	106.609	108.074	109.544
Exports (Mil. Cwt)	U.S.	69.530	73.085	74.095	80.382	81.190	82.038	82.875	83.710	84.543	85.378
Farm Price ($/Cwt)	U.S.	18.343	17.475	17.440	15.680	15.711	15.729	15.750	15.773	15.795	15.818
	DS	18.319	17.454	17.419	15.662	15.693	15.711	15.732	15.755	15.777	15.799
Loan Rate ($/Cwt)	U.S.	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
Loan Deficiency Payments ($/Cwt)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246
Target Price ($/Cwt)	U.S.	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.528	451.618	457.707	463.796	469.885	475.974	482.063	488.152	494.241	500.330
Expected Net Returns ($/Acre)	DS	540.256	932.180	879.267	884.412	764.968	773.475	781.064	788.934	796.899	804.930

Table D-24. Forecast Result for the U.S. LG Rice Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	1.788	2.687	2.818	2.811	2.792	2.813	2.855	2.847	2.841	2.843
	DS	1.480	1.913	2.072	2.111	2.129	2.138	2.143	2.147	2.151	2.155
Harvested Acres (Mil. Acres)	U.S.	1.744	2.628	2.763	2.760	2.743	2.763	2.803	2.796	2.791	2.793
	DS	1.452	1.892	2.055	2.094	2.112	2.122	2.127	2.131	2.135	2.139
Yields (Cwt/Acre)	DS	69.951	70.738	71.525	72.311	73.098	73.885	74.671	75.458	76.245	77.032
Total Supply (Mil. Cwt)	U.S.	182.943	188.859	201.954	206.426	209.400	211.771	213.841	215.830	217.799	219.769
Production (Mil. Cwt)	U.S.	143.537	145.859	158.954	163.426	166.400	168.771	170.841	172.830	174.799	176.769
Total Demand (Mil. Cwt)	U.S.	185.668	194.178	202.756	205.246	207.700	210.302	212.799	215.277	217.742	220.178
Domestic and Residual (Mil. Cwt)	U.S.	88.725	93.893	98.115	99.654	101.177	102.766	104.311	105.853	107.393	108.918
Exports (Mil. Cwt)	U.S.	68.944	72.285	76.642	77.592	78.523	79.537	80.488	81.424	82.349	83.260
Farm Price ($/Cwt)	U.S.	18.159	17.361	16.232	16.217	16.207	16.171	16.155	16.144	16.137	16.135
	DS	18.136	17.340	16.213	16.198	16.188	16.152	16.137	16.126	16.118	16.116
Loan Rate ($/Cwt)	U.S.	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
Loan Deficiency Payments ($/Cwt)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246
Target Price ($/Cwt)	U.S.	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.528	451.618	457.707	463.796	469.885	475.974	482.063	488.152	494.241	500.330
Expected Net Returns ($/Acre)	DS	540.256	919.337	871.217	798.162	803.718	809.704	813.668	819.118	824.897	830.950

Table D-25. Forecast Result for the U.S. LG Rice Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	1.788	2.652	2.788	2.758	2.730	2.748	2.790	2.783	2.778	2.780
	DS	1.480	1.877	2.042	2.057	2.066	2.073	2.078	2.083	2.088	2.092
Harvested Acres (Mil. Acres)	U.S.	1.744	2.592	2.732	2.705	2.679	2.697	2.737	2.730	2.726	2.729
	DS	1.452	1.856	2.024	2.039	2.049	2.056	2.061	2.066	2.071	2.075
Yields (Cwt/Acre)	DS	69.951	70.738	71.525	72.311	73.098	73.885	74.671	75.458	76.245	77.032
Total Supply (Mil. Cwt)	U.S.	182.943	186.292	199.757	202.461	204.755	206.876	208.902	210.895	212.880	214.869
Production (Mil. Cwt)	U.S.	143.537	143.292	156.757	159.461	161.755	163.876	165.902	167.895	169.880	171.869
Total Demand (Mil. Cwt)	U.S.	185.776	188.384	202.802	205.115	207.444	209.818	212.191	214.562	216.934	219.305
Domestic and Residual (Mil. Cwt)	U.S.	88.706	90.385	97.333	98.836	100.339	101.842	103.346	104.852	106.359	107.870
Exports (Mil. Cwt)	U.S.	69.070	69.999	77.469	78.279	79.105	79.976	80.845	81.711	82.574	83.436
Farm Price ($/Cwt)	U.S.	18.117	18.109	15.961	15.992	16.017	16.027	16.039	16.051	16.064	16.077
	DS	18.094	18.086	15.943	15.973	15.998	16.009	16.020	16.032	16.045	16.058
Loan Rate ($/Cwt)	U.S.	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
Loan Deficiency Payments ($/Cwt)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reference Price ($/Cwt)	U.S.	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000
Price Loss Coverage ($/Cwt)	U.S.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Agricultural Risk Coverage ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.528	451.618	457.707	463.796	469.885	475.974	482.063	488.152	494.241	500.330
Expected Net Returns ($/Acre)	DS	540.256	820.200	827.746	682.604	691.258	699.566	706.823	714.173	721.596	729.097

Table D-26. Forecast Result for the U.S. MSG Rice Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	0.696	0.736	0.756	0.783	0.796	0.801	0.801	0.797	0.792	0.786
	DS	0.141	0.177	0.194	0.212	0.219	0.219	0.215	0.209	0.202	0.194
	FW	0.555	0.559	0.563	0.571	0.578	0.582	0.586	0.589	0.590	0.592
Harvested Acres (Mil. Acres)	U.S.	0.692	0.731	0.751	0.778	0.790	0.795	0.795	0.792	0.787	0.781
	DS	0.140	0.175	0.191	0.210	0.216	0.216	0.212	0.207	0.200	0.192
	FW	0.552	0.556	0.559	0.568	0.574	0.579	0.582	0.585	0.587	0.589
Yields (Cwt/Acre)	DS	73.137	74.095	75.053	76.012	76.970	77.928	78.886	79.844	80.803	81.761
	FW	82.934	83.196	83.457	83.718	83.980	84.242	84.503	84.765	85.026	85.288
Total Supply (Mil. Cwt)	U.S.	69.787	72.217	74.061	76.476	77.852	78.603	78.965	79.086	79.051	78.914
Production (Mil. Cwt)	U.S.	55.994	59.217	61.061	63.476	64.852	65.603	65.965	66.086	66.051	65.914
Total Demand (Mil. Cwt)	U.S.	82.769	83.639	79.079	80.283	81.497	82.717	83.935	85.149	86.359	87.564
Domestic and Residual (Mil. Cwt)	U.S.	41.126	41.378	37.902	38.356	38.816	39.273	39.729	40.184	40.637	41.088
Exports (Mil. Cwt)	U.S.	31.642	32.261	31.176	31.926	32.681	33.444	34.206	34.965	35.722	36.476
Farm Price ($/Cwt)	U.S.	15.608	15.751	17.519	17.537	17.551	17.557	17.564	17.573	17.585	17.599
	DS	15.733	15.877	17.667	17.686	17.700	17.706	17.713	17.723	17.735	17.749
	FW	15.733	15.877	17.667	17.686	17.700	17.706	17.713	17.723	17.735	17.749
Loan Rate ($/Cwt)	U.S.	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
Loan Deficiency Payments ($/Cwt)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246
Target Price ($/Cwt)	U.S.	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.528	451.618	457.707	463.796	469.885	475.974	482.063	488.152	494.241	500.330
Expected Net Returns ($/Acre)	DS	685.01	801.35	821.07	964.54	976.80	988.71	1,000.05	1,011.52	1,023.15	1,035.00
	FW	851.86	955.48	965.56	1,113.01	1,113.10	1,112.79	1,111.83	1,111.01	1,110.35	1,109.90

Table D-27. Forecast Result for the U.S. MSG Rice Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	0.696	0.736	0.757	0.783	0.795	0.799	0.799	0.795	0.790	0.784
	DS	0.141	0.177	0.194	0.212	0.218	0.218	0.214	0.208	0.201	0.193
	FW	0.555	0.559	0.563	0.571	0.577	0.582	0.585	0.588	0.590	0.591
Harvested Acres (Mil. Acres)	U.S.	0.692	0.731	0.751	0.777	0.789	0.793	0.793	0.790	0.785	0.779
	DS	0.140	0.175	0.192	0.209	0.215	0.215	0.211	0.205	0.198	0.191
	FW	0.552	0.556	0.560	0.568	0.574	0.578	0.582	0.584	0.586	0.588
Yields (Cwt/Acre)	DS	73.137	74.095	75.053	76.012	76.970	77.928	78.886	79.844	80.803	81.761
	FW	82.934	83.196	83.457	83.718	83.980	84.242	84.503	84.765	85.026	85.288
Total Supply (Mil. Cwt)	U.S.	69.787	72.244	74.088	76.429	77.757	78.476	78.817	78.922	78.875	78.728
Production (Mil. Cwt)	U.S.	55.994	59.244	61.088	63.429	64.757	65.476	65.817	65.922	65.875	65.728
Total Demand (Mil. Cwt)	U.S.	82.174	83.103	78.803	80.006	81.217	82.437	83.654	84.869	86.079	87.284
Domestic and Residual (Mil. Cwt)	U.S.	40.917	41.204	37.894	38.347	38.804	39.260	39.715	40.170	40.622	41.073
Exports (Mil. Cwt)	U.S.	31.257	31.899	30.908	31.659	32.413	33.177	33.939	34.699	35.457	36.212
Farm Price ($/Cwt)	U.S.	15.642	15.763	17.442	17.460	17.474	17.479	17.486	17.495	17.506	17.519
	DS	15.768	15.890	17.589	17.608	17.622	17.627	17.634	17.643	17.654	17.668
	FW	15.768	15.890	17.589	17.608	17.622	17.627	17.634	17.643	17.654	17.668
Loan Rate ($/Cwt)	U.S.	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
Loan Deficiency Payments ($/Cwt)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246
Target Price ($/Cwt)	U.S.	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.528	451.618	457.707	463.796	469.885	475.974	482.063	488.152	494.241	500.330
Expected Net Returns ($/Acre)	DS	685.01	803.93	822.01	958.68	970.83	982.69	993.92	1,005.27	1,016.78	1,028.49
	FW	851.86	958.40	966.62	1,106.49	1,106.53	1,106.22	1,105.20	1,104.32	1,103.58	1,103.05

Table D-28. Forecast Result for the U.S. MSG Rice Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	0.696	0.736	0.777	0.798	0.817	0.825	0.827	0.825	0.821	0.816
	DS	0.141	0.177	0.208	0.221	0.232	0.234	0.231	0.226	0.219	0.212
	FW	0.555	0.559	0.569	0.576	0.585	0.591	0.596	0.599	0.602	0.604
Harvested Acres (Mil. Acres)	U.S.	0.692	0.731	0.771	0.792	0.810	0.819	0.821	0.819	0.815	0.810
	DS	0.140	0.175	0.205	0.219	0.229	0.231	0.228	0.223	0.216	0.209
	FW	0.552	0.556	0.566	0.573	0.581	0.588	0.592	0.596	0.598	0.600
Yields (Cwt/Acre)	DS	73.137	74.095	75.053	76.012	76.970	77.928	78.886	79.844	80.803	81.761
	FW	82.934	83.196	83.457	83.718	83.980	84.242	84.503	84.765	85.026	85.288
Total Supply (Mil. Cwt)	U.S.	69.787	72.191	75.624	77.606	79.451	80.497	81.058	81.316	81.379	81.313
Production (Mil. Cwt)	U.S.	55.994	59.191	62.624	64.606	66.451	67.497	68.058	68.316	68.379	68.313
Total Demand (Mil. Cwt)	U.S.	83.358	79.411	80.558	78.571	79.836	81.083	82.332	83.576	84.816	86.049
Domestic and Residual (Mil. Cwt)	U.S.	41.334	38.824	39.227	37.382	37.870	38.344	38.819	39.293	39.765	40.233
Exports (Mil. Cwt)	U.S.	32.025	30.586	31.331	31.189	31.966	32.740	33.512	34.283	35.051	35.816
Farm Price ($/Cwt)	U.S.	15.576	17.681	17.704	18.573	18.566	18.561	18.558	18.557	18.558	18.562
	DS	15.700	17.831	17.855	18.735	18.727	18.723	18.719	18.718	18.719	18.723
	FW	15.700	17.831	17.855	18.735	18.727	18.723	18.719	18.718	18.719	18.723
Loan Rate ($/Cwt)	U.S.	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
Loan Deficiency Payments ($/Cwt)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246
Target Price ($/Cwt)	U.S.	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.528	451.618	457.707	463.796	469.885	475.974	482.063	488.152	494.241	500.330
Expected Net Returns ($/Acre)	DS	685.01	798.99	965.84	978.62	1,056.51	1,067.79	1,079.31	1,090.88	1,102.61	1,114.56
	FW	851.86	952.80	1,128.11	1,128.66	1,200.90	1,199.07	1,197.51	1,196.02	1,194.71	1,193.62

Table D-29. Forecast Result for the U.S. MSG Rice Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	0.696	0.737	0.777	0.806	0.820	0.825	0.826	0.824	0.819	0.814
	DS	0.141	0.177	0.208	0.227	0.234	0.234	0.230	0.224	0.218	0.210
	FW	0.555	0.559	0.569	0.579	0.586	0.592	0.596	0.599	0.601	0.603
Harvested Acres (Mil. Acres)	U.S.	0.692	0.731	0.772	0.800	0.814	0.819	0.820	0.817	0.813	0.808
	DS	0.140	0.175	0.206	0.224	0.231	0.231	0.227	0.222	0.215	0.208
	FW	0.552	0.556	0.566	0.576	0.583	0.588	0.593	0.596	0.598	0.600
Yields (Cwt/Acre)	DS	73.137	74.095	75.053	76.012	76.970	77.928	78.886	79.844	80.803	81.761
	FW	82.934	83.196	83.457	83.718	83.980	84.242	84.503	84.765	85.026	85.288
Total Supply (Mil. Cwt)	U.S.	69.787	72.256	75.668	78.228	79.714	80.548	80.996	81.193	81.229	81.159
Production (Mil. Cwt)	U.S.	55.994	59.256	62.668	65.228	66.714	67.548	67.996	68.193	68.229	68.159
Total Demand (Mil. Cwt)	U.S.	82.694	78.967	77.756	78.952	80.161	81.319	82.506	83.692	84.873	86.069
Domestic and Residual (Mil. Cwt)	U.S.	41.103	38.733	37.522	37.956	38.401	38.808	39.239	39.670	40.101	40.540
Exports (Mil. Cwt)	U.S.	31.590	30.234	30.235	30.996	31.761	32.511	33.268	34.022	34.773	35.529
Farm Price ($/Cwt)	U.S.	15.657	17.684	18.417	18.425	18.429	18.447	18.459	18.473	18.490	18.503
	DS	15.783	17.835	18.576	18.585	18.588	18.607	18.619	18.633	18.651	18.664
	FW	15.783	17.835	18.576	18.585	18.588	18.607	18.619	18.633	18.651	18.664
Loan Rate ($/Cwt)	U.S.	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
Loan Deficiency Payments ($/Cwt)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246	96.246
Target Price ($/Cwt)	U.S.	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500	10.500
Counter-cyclical Payments ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.528	451.618	457.707	463.796	469.885	475.974	482.063	488.152	494.241	500.330
Expected Net Returns ($/Acre)	DS	685.01	805.03	966.10	1,032.76	1,045.10	1,057.11	1,070.26	1,082.95	1,095.87	1,109.06
	FW	851.86	959.65	1,128.41	1,188.87	1,188.33	1,187.42	1,187.73	1,187.53	1,187.55	1,187.83

Table D-30. Forecast Result for the U.S. MSG Rice Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	0.696	0.723	0.735	0.758	0.768	0.771	0.770	0.766	0.760	0.754
	DS	0.141	0.167	0.179	0.195	0.200	0.200	0.195	0.189	0.183	0.175
	FW	0.555	0.556	0.556	0.563	0.568	0.571	0.574	0.576	0.578	0.579
Harvested Acres (Mil. Acres)	U.S.	0.692	0.718	0.730	0.752	0.762	0.765	0.764	0.760	0.755	0.749
	DS	0.140	0.166	0.177	0.193	0.198	0.197	0.193	0.188	0.181	0.173
	FW	0.552	0.552	0.553	0.559	0.564	0.568	0.571	0.573	0.575	0.576
Yields (Cwt/Acre)	DS	73.137	74.095	75.053	76.012	76.970	77.928	78.886	79.844	80.803	81.761
	FW	82.934	83.196	83.457	83.718	83.980	84.242	84.503	84.765	85.026	85.288
Total Supply (Mil. Cwt)	U.S.	69.787	71.214	72.416	74.476	75.626	76.231	76.492	76.540	76.453	76.277
Production (Mil. Cwt)	U.S.	55.994	58.214	59.416	61.476	62.626	63.231	63.492	63.540	63.453	63.277
Total Demand (Mil. Cwt)	U.S.	82.769	83.710	79.345	80.520	81.704	82.911	84.116	85.317	86.513	87.705
Domestic and Residual (Mil. Cwt)	U.S.	41.126	41.434	38.230	38.672	39.116	39.566	40.016	40.463	40.909	41.353
Exports (Mil. Cwt)	U.S.	31.643	32.276	31.115	31.848	32.588	33.345	34.100	34.853	35.604	36.352
Farm Price ($/Cwt)	U.S.	15.607	15.736	17.578	17.612	17.640	17.651	17.665	17.680	17.698	17.718
	DS	15.732	15.863	17.727	17.761	17.790	17.802	17.815	17.831	17.849	17.869
	FW	15.732	15.863	17.727	17.761	17.790	17.802	17.815	17.831	17.849	17.869
Loan Rate ($/Cwt)	U.S.	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
Loan Deficiency Payments ($/Cwt)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reference Price ($/Cwt)	U.S.	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000
Price Loss Coverage ($/Cwt)	U.S.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Agricultural Risk Coverage ($/Acre)	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.528	451.618	457.707	463.796	469.885	475.974	482.063	488.152	494.241	500.330
Expected Net Returns ($/Acre)	DS	685.014	705.069	723.751	872.763	886.282	899.384	911.272	923.322	935.551	947.998
	FW	851.863	859.196	868.108	1021.73	1023.17	1024.09	1023.66	1023.39	1023.28	1023.38

Table D-31. Forecast Result for the U.S. Sorghum Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	6.904	7.362	7.434	7.434	7.447	7.466	7.478	7.449	7.425	7.407
	CP	3.320	3.366	3.402	3.431	3.454	3.472	3.487	3.498	3.507	3.515
	SP	3.095	3.307	3.399	3.421	3.416	3.399	3.376	3.350	3.324	3.296
Harvested Acres (Mil. Acres)	U.S.	6.028	6.277	6.401	6.449	6.466	6.466	6.458	6.444	6.427	6.406
	CP	2.877	2.920	2.954	2.982	3.003	3.020	3.034	3.045	3.053	3.060
	SP	2.611	2.817	2.906	2.927	2.923	2.906	2.884	2.859	2.833	2.806
Yields (Bushels/Acre)	CP	76.982	77.198	77.415	77.631	77.848	78.064	78.281	78.497	78.714	78.930
	SP	54.054	53.937	53.819	53.701	53.583	53.465	53.348	53.230	53.112	52.994
Total Supply (Mil. Bushels)	U.S.	439.461	439.360	447.125	450.650	452.402	453.151	453.364	453.193	452.823	452.256
Production (Mil. Bushels)	U.S.	398.630	413.360	421.125	424.650	426.402	427.151	427.364	427.193	426.823	426.256
Total Demand (Mil. Bushels)	U.S.	439.461	439.350	447.131	450.652	452.463	453.172	453.381	453.205	452.829	452.258
Seed (Mil. Bushels)	U.S.	0.916	0.924	0.924	0.926	0.928	0.930	0.926	0.923	0.921	0.919
Feed (Mil. Bushels)	U.S.	196.550	190.377	186.295	184.262	179.223	175.743	171.354	166.826	161.999	158.880
Food (Mil. Bushels)	U.S.	37.832	58.907	62.674	70.633	73.622	76.669	78.523	81.021	83.098	87.143
Exports (Mil. Bushels)	U.S.	179.163	164.142	172.237	169.832	173.690	174.830	177.578	179.434	181.811	180.315
Farm Price ($/Bushel)	U.S.	4.424	4.913	4.650	4.728	4.602	4.565	4.476	4.415	4.338	4.387
	CP	4.393	4.890	4.622	4.702	4.574	4.536	4.446	4.384	4.305	4.355
	SP	4.150	4.551	4.335	4.399	4.296	4.266	4.193	4.143	4.080	4.119
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	138.644	141.809	144.973	148.137	151.302	154.466	157.630	160.795	163.959	167.123
Expected Net Returns ($/Acre)	CP	189.479	216.410	252.562	229.722	233.736	221.653	216.536	207.237	200.214	191.809
	SP	221.730	102.562	120.536	105.205	104.978	95.777	90.480	82.900	76.604	69.581

Table D-32. Forecast Result for the U.S. Sorghum Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	6.904	7.360	7.433	7.430	7.441	7.456	7.466	7.434	7.407	7.386
	CP	3.320	3.366	3.402	3.431	3.454	3.472	3.487	3.498	3.507	3.515
	SP	3.095	3.305	3.397	3.416	3.409	3.389	3.364	3.335	3.306	3.275
Harvested Acres (Mil. Acres)	U.S.	6.028	6.275	6.399	6.445	6.460	6.457	6.446	6.429	6.409	6.386
	CP	2.877	2.920	2.954	2.982	3.003	3.020	3.034	3.045	3.053	3.060
	SP	2.611	2.815	2.905	2.923	2.916	2.896	2.872	2.844	2.816	2.786
Yields (Bushels/Acre)	CP	76.982	77.198	77.415	77.631	77.848	78.064	78.281	78.497	78.714	78.930
	SP	54.054	53.937	53.819	53.701	53.583	53.465	53.348	53.230	53.112	52.994
Total Supply (Mil. Bushels)	U.S.	439.461	439.243	447.031	450.437	452.060	452.632	452.708	452.384	451.887	451.168
Production (Mil. Bushels)	U.S.	398.630	413.243	421.031	424.437	426.060	426.632	426.708	426.384	425.887	425.168
Total Demand (Mil. Bushels)	U.S.	439.461	439.245	447.035	450.451	452.113	452.617	452.697	452.361	451.872	451.145
Seed (Mil. Bushels)	U.S.	0.915	0.924	0.924	0.925	0.927	0.928	0.924	0.921	0.918	0.917
Feed (Mil. Bushels)	U.S.	195.217	188.115	184.019	182.682	177.922	174.729	170.414	166.066	161.357	158.454
Food (Mil. Bushels)	U.S.	43.898	64.768	67.400	74.474	76.505	79.296	80.822	83.283	85.145	89.084
Exports (Mil. Bushels)	U.S.	174.431	160.438	169.692	167.370	171.759	172.664	175.537	177.090	179.452	177.691
Farm Price ($/Bushel)	U.S.	4.256	4.711	4.410	4.486	4.343	4.314	4.220	4.170	4.093	4.150
	CP	4.222	4.685	4.379	4.456	4.310	4.280	4.185	4.134	4.056	4.114
	SP	4.012	4.386	4.139	4.201	4.083	4.059	3.983	3.941	3.878	3.925
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	138.644	141.809	144.973	148.137	151.302	154.466	157.630	160.795	163.959	167.123
Expected Net Returns ($/Acre)	CP	189.479	203.239	236.727	210.876	214.622	201.118	196.551	186.873	180.580	172.161
	SP	221.730	95.099	111.609	94.634	94.309	84.373	79.436	71.702	65.861	58.885

Table D-33. Forecast Result for the U.S. Sorghum Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	6.904	7.364	7.435	7.436	7.452	7.473	7.488	7.461	7.439	7.423
	CP	3.320	3.366	3.402	3.431	3.454	3.472	3.487	3.498	3.507	3.515
	SP	3.095	3.309	3.400	3.423	3.420	3.406	3.385	3.362	3.338	3.312
Harvested Acres (Mil. Acres)	U.S.	6.028	6.279	6.402	6.451	6.470	6.473	6.467	6.455	6.440	6.422
	CP	2.877	2.920	2.954	2.982	3.003	3.020	3.034	3.045	3.053	3.060
	SP	2.611	2.819	2.907	2.929	2.927	2.913	2.893	2.870	2.847	2.822
Yields (Bushels/Acre)	CP	76.982	77.198	77.415	77.631	77.848	78.064	78.281	78.497	78.714	78.930
	SP	54.054	53.937	53.819	53.701	53.583	53.465	53.348	53.230	53.112	52.994
Total Supply (Mil. Bushels)	U.S.	439.461	439.460	447.170	450.763	452.614	453.510	453.842	453.800	453.542	453.100
Production (Mil. Bushels)	U.S.	398.630	413.460	421.170	424.763	426.614	427.510	427.842	427.800	427.542	427.100
Total Demand (Mil. Bushels)	U.S.	439.436	439.460	447.178	450.763	452.680	453.556	453.902	453.851	453.588	453.166
Seed (Mil. Bushels)	U.S.	0.916	0.924	0.925	0.926	0.929	0.931	0.928	0.925	0.923	0.921
Feed (Mil. Bushels)	U.S.	197.780	192.743	188.846	186.149	180.794	176.987	172.491	167.769	162.823	159.523
Food (Mil. Bushels)	U.S.	31.748	52.371	57.195	65.992	70.013	73.379	75.637	78.229	80.538	84.708
Exports (Mil. Bushels)	U.S.	183.992	168.422	175.212	172.696	175.944	177.259	179.847	181.929	184.304	183.014
Farm Price ($/Bushel)	U.S.	4.589	5.096	4.875	4.957	4.851	4.808	4.724	4.656	4.579	4.621
	CP	4.561	5.076	4.851	4.935	4.827	4.784	4.698	4.629	4.551	4.593
	SP	4.286	4.701	4.520	4.587	4.501	4.465	4.396	4.341	4.277	4.312
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	138.644	141.809	144.973	148.137	151.302	154.466	157.630	160.795	163.959	167.123
Expected Net Returns ($/Acre)	CP	189.479	229.336	266.927	247.470	251.817	241.358	235.841	227.010	219.456	211.108
	SP	221.730	109.885	128.634	115.160	115.070	106.720	101.148	93.773	87.132	80.089

Table D-34. Forecast Result for the U.S. Sorghum Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	6.904	7.363	7.433	7.436	7.451	7.473	7.488	7.462	7.438	7.419
	CP	3.320	3.366	3.402	3.431	3.454	3.472	3.487	3.498	3.507	3.515
	SP	3.095	3.308	3.397	3.422	3.419	3.406	3.386	3.363	3.337	3.308
Harvested Acres (Mil. Acres)	U.S.	6.028	6.278	6.399	6.450	6.469	6.474	6.468	6.456	6.439	6.418
	CP	2.877	2.920	2.954	2.982	3.003	3.020	3.034	3.045	3.053	3.060
	SP	2.611	2.818	2.905	2.928	2.926	2.913	2.894	2.871	2.846	2.818
Yields (Bushels/Acre)	CP	76.982	77.198	77.415	77.631	77.848	78.064	78.281	78.497	78.714	78.930
	SP	54.054	53.937	53.819	53.701	53.583	53.465	53.348	53.230	53.112	52.994
Total Supply (Mil. Bushels)	U.S.	439.461	439.420	447.037	450.719	452.569	453.534	453.875	453.837	453.496	452.885
Production (Mil. Bushels)	U.S.	398.630	413.420	421.037	424.719	426.569	427.534	427.875	427.837	427.496	426.885
Total Demand (Mil. Bushels)	U.S.	439.460	439.420	447.037	450.720	452.537	453.617	453.888	453.849	453.508	452.947
Seed (Mil. Bushels)	U.S.	0.916	0.924	0.924	0.926	0.929	0.931	0.928	0.925	0.922	0.920
Feed (Mil. Bushels)	U.S.	211.638	201.660	201.635	196.389	190.923	185.520	179.783	173.551	167.159	162.466
Food (Mil. Bushels)	U.S.	62.053	72.905	83.360	84.355	86.990	86.649	86.625	86.512	86.417	88.463
Exports (Mil. Bushels)	U.S.	139.853	138.930	136.117	144.049	148.695	155.517	161.552	167.862	174.009	176.098
Farm Price ($/Bushel)	U.S.	5.703	5.733	5.825	5.567	5.415	5.194	4.997	4.792	4.592	4.524
	CP	5.694	5.724	5.817	5.555	5.401	5.175	4.976	4.767	4.564	4.494
	SP	5.200	5.224	5.299	5.088	4.964	4.781	4.620	4.452	4.288	4.232
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868	16.868
Target Price ($/Bushel)	U.S.	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630	2.630
Counter-cyclical Payments ($/Acre)	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	138.644	141.809	144.973	148.137	151.302	154.466	157.630	160.795	163.959	167.123
Expected Net Returns ($/Acre)	CP	189.479	316.528	316.954	322.232	299.957	286.028	266.416	248.741	230.267	212.127
	SP	221.730	159.284	156.836	157.097	141.939	131.529	118.044	105.722	93.047	80.643

Table D-35. Forecast Result for the U.S. Sorghum Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	6.904	7.330	7.395	7.393	7.401	7.414	7.424	7.391	7.364	7.341
	CP	3.320	3.366	3.402	3.431	3.454	3.472	3.487	3.498	3.507	3.515
	SP	3.095	3.275	3.360	3.379	3.369	3.347	3.321	3.292	3.262	3.230
Harvested Acres (Mil. Acres)	U.S.	6.028	6.246	6.363	6.408	6.421	6.416	6.405	6.387	6.367	6.343
	CP	2.877	2.920	2.954	2.982	3.003	3.020	3.034	3.045	3.053	3.060
	SP	2.611	2.786	2.868	2.887	2.877	2.856	2.831	2.802	2.773	2.743
Yields (Bushels/Acre)	CP	76.982	77.198	77.415	77.631	77.848	78.064	78.281	78.497	78.714	78.930
	SP	54.054	53.937	53.819	53.701	53.583	53.465	53.348	53.230	53.112	52.994
Total Supply (Mil. Bushels)	U.S.	439.461	437.678	445.072	448.484	449.975	450.467	450.533	450.171	449.646	448.884
Production (Mil. Bushels)	U.S.	398.630	411.678	419.072	422.484	423.975	424.467	424.533	424.171	423.646	422.884
Total Demand (Mil. Bushels)	U.S.	439.461	437.671	445.082	448.474	450.042	450.489	450.545	450.179	449.645	448.881
Seed (Mil. Bushels)	U.S.	0.912	0.920	0.919	0.920	0.922	0.923	0.919	0.916	0.913	0.911
Feed (Mil. Bushels)	U.S.	196.521	190.100	185.563	183.795	178.486	175.055	170.495	165.906	160.923	157.736
Food (Mil. Bushels)	U.S.	37.874	58.959	61.857	70.065	72.495	75.602	77.171	79.727	81.660	85.681
Exports (Mil. Bushels)	U.S.	179.155	162.693	171.743	168.694	173.139	173.909	176.960	178.630	181.149	179.553
Farm Price ($/Bushel)	U.S.	4.425	4.960	4.666	4.765	4.620	4.595	4.496	4.442	4.360	4.412
	CP	4.393	4.938	4.639	4.739	4.592	4.567	4.466	4.411	4.327	4.380
	SP	4.150	4.590	4.348	4.430	4.311	4.290	4.209	4.164	4.097	4.140
Loan Rate ($/Bushel)	U.S.	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Loan Deficiency Payments ($/Bushel)	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reference Price ($/Bushel)	U.S.	3.950	3.950	3.950	3.950	3.950	3.950	3.950	3.950	3.950	3.950
Price Loss Coverage ($/Bushel)	U.S.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Agricultural Risk Coverage ($/Acre)	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	7.373	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	138.644	141.809	144.973	148.137	151.302	154.466	157.630	160.795	163.959	167.123
Expected Net Returns ($/Acre)	CP	189.479	199.564	239.395	214.121	219.791	206.205	202.046	191.968	185.434	176.664
	SP	221.730	85.706	105.754	90.527	89.741	79.698	74.926	66.911	60.878	53.651

Table D-36. Forecast Result for the U.S. Soybean Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	77.163	79.164	79.680	80.701	81.560	82.527	83.416	84.329	85.208	86.078
	CB	34.400	34.720	34.933	35.160	35.334	35.493	35.620	35.730	35.819	35.895
	CP	8.750	9.833	9.994	10.251	10.448	10.673	10.881	11.097	11.308	11.522
	DS	6.430	6.408	6.381	6.373	6.363	6.359	6.355	6.354	6.352	6.351
	LS	10.380	10.611	10.777	11.002	11.209	11.434	11.656	11.885	12.115	12.349
	NE	1.628	1.631	1.646	1.672	1.691	1.713	1.733	1.754	1.775	1.796
	NP	9.200	9.794	10.027	10.394	10.676	11.000	11.298	11.609	11.912	12.220
	SE	6.375	6.167	5.923	5.849	5.840	5.855	5.872	5.901	5.927	5.946
Harvested Acres (Mil. Acres)	U.S.	75.899	77.900	78.441	79.466	80.323	81.284	82.167	83.071	83.942	84.805
	CB	34.118	34.444	34.661	34.894	35.070	35.233	35.363	35.474	35.566	35.643
	CP	8.550	9.610	9.767	10.019	10.211	10.431	10.635	10.846	11.053	11.262
	DS	6.233	6.213	6.187	6.180	6.171	6.167	6.163	6.162	6.160	6.159
	LS	10.235	10.466	10.633	10.860	11.067	11.293	11.516	11.746	11.976	12.211
	NE	1.603	1.606	1.621	1.647	1.666	1.688	1.708	1.729	1.750	1.771
	NP	9.069	9.655	9.886	10.248	10.527	10.846	11.142	11.448	11.748	12.052
	SE	6.091	5.905	5.686	5.620	5.611	5.626	5.641	5.667	5.690	5.707
Yields (Bushels/Acre)	CB	48.498	48.901	49.305	49.708	50.112	50.516	50.919	51.323	51.726	52.130
	CP	46.472	47.060	47.647	48.235	48.823	49.411	49.999	50.586	51.174	51.762
	DS	40.515	41.189	41.863	42.537	43.212	43.886	44.560	45.234	45.908	46.582
	LS	42.731	42.988	43.245	43.501	43.758	44.015	44.272	44.529	44.786	45.043
	NE	40.893	41.306	41.720	42.133	42.547	42.961	43.374	43.788	44.201	44.615
	NP	33.301	33.447	33.593	33.738	33.884	34.030	34.176	34.321	34.467	34.613
	SE	36.212	36.617	37.021	37.426	37.830	38.235	38.640	39.044	39.449	39.853
Total Supply (Mil. Bushels)	U.S.	3,618.60	3,705.94	3,761.39	3,836.49	3,904.76	3,977.64	4,047.65	4,118.91	4,189.16	4,259.53
Production (Mil. Bushels)	U.S.	3,429.98	3,447.94	3,503.39	3,578.49	3,646.76	3,719.64	3,789.65	3,860.91	3,931.16	4,001.53
Total Demand (Mil. Bushels)	U.S.	3,618.67	3,705.92	3,761.40	3,836.64	3,904.86	3,977.41	4,047.61	4,118.76	4,189.33	4,259.53
Seed, Feed and Residual (Mil. Bushels)	U.S.	69.775	72.002	66.685	69.526	71.530	75.685	79.575	84.021	88.384	92.707
Crushing (Mil. Bushels)	U.S.	1,880.03	1,911.79	1,936.72	1,970.49	2,003.63	2,039.36	2,074.92	2,111.16	2,147.50	2,183.76
Exports (Mil. Bushels)	U.S.	1,423.87	1,477.14	1,513.00	1,551.63	1,584.70	1,617.37	1,648.12	1,678.58	1,708.45	1,738.06

Table D-36 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	14.626	14.774	15.410	15.322	15.292	15.071	14.868	14.616	14.370	14.129
	CB	14.881	15.033	15.685	15.595	15.595	15.337	15.129	14.871	14.619	14.372
	CP	14.258	14.402	15.024	14.937	14.908	14.692	14.494	14.248	14.008	13.773
	DS	14.378	14.520	15.133	15.048	15.019	14.806	14.611	14.368	14.132	13.900
	LS	14.324	14.468	15.091	15.004	14.975	14.759	14.560	14.314	14.074	13.838
	NE	15.013	15.168	15.834	15.741	15.710	15.479	15.266	15.003	14.746	14.494
	NP	14.250	14.397	15.030	14.942	14.912	14.693	14.491	14.240	13.996	13.757
	SE	15.019	15.173	15.835	15.743	15.712	15.482	15.271	15.009	14.753	14.502
Loan Rate ($/Bushel)	U.S.	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
Target Price ($/Bushel)	U.S.	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	122.531	125.131	127.732	130.332	132.933	135.533	138.134	140.734	143.334	145.935
Expected Net Returns ($/Acre)	CB	464.839	610.709	621.536	657.177	656.410	658.559	650.790	643.781	634.026	624.402
	CP	331.609	551.599	564.181	599.658	601.732	606.479	601.976	598.100	591.571	585.074
	DS	488.720	471.542	484.502	517.336	521.323	527.616	525.802	524.475	520.751	516.984
	LS	477.735	501.090	508.389	536.409	533.932	533.901	525.637	518.042	508.214	498.540
	NE	482.789	502.950	512.954	544.403	544.462	547.035	540.997	535.588	527.759	520.008
	NP	349.385	363.575	367.971	388.716	385.347	383.911	376.008	368.653	359.568	350.630
	SE	432.063	432.891	442.004	470.047	470.418	473.005	467.971	463.477	456.823	450.219

Table D-37. Forecast Result for the U.S. Soybean Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	77.163	79.141	79.537	80.531	81.321	82.260	83.098	83.983	84.823	85.668
	CB	34.400	34.709	34.895	35.107	35.261	35.408	35.522	35.625	35.708	35.780
	CP	8.750	9.824	9.969	10.234	10.425	10.654	10.861	11.080	11.292	11.508
	DS	6.430	6.406	6.373	6.363	6.350	6.345	6.340	6.338	6.337	6.336
	LS	10.380	10.599	10.732	10.933	11.106	11.302	11.491	11.690	11.888	12.093
	NE	1.628	1.630	1.642	1.670	1.688	1.710	1.730	1.752	1.772	1.794
	NP	9.200	9.785	9.997	10.373	10.646	10.975	11.270	11.584	11.887	12.197
	SE	6.375	6.190	5.927	5.851	5.845	5.865	5.883	5.914	5.940	5.959
Harvested Acres (Mil. Acres)	U.S.	75.899	77.875	78.298	79.296	80.083	81.015	81.847	82.722	83.555	84.391
	CB	34.118	34.433	34.623	34.840	34.996	35.146	35.263	35.367	35.452	35.526
	CP	8.550	9.601	9.743	10.002	10.189	10.413	10.615	10.830	11.037	11.249
	DS	6.233	6.211	6.180	6.170	6.158	6.154	6.149	6.147	6.146	6.145
	LS	10.235	10.454	10.589	10.790	10.964	11.161	11.350	11.550	11.749	11.955
	NE	1.603	1.605	1.617	1.645	1.662	1.685	1.705	1.727	1.747	1.768
	NP	9.069	9.647	9.856	10.227	10.497	10.822	11.114	11.424	11.723	12.029
	SE	6.091	5.925	5.690	5.622	5.616	5.634	5.650	5.678	5.701	5.718
Yields (Bushels/Acre)	CB	48.498	48.901	49.305	49.708	50.112	50.516	50.919	51.323	51.726	52.130
	CP	46.472	47.060	47.647	48.235	48.823	49.411	49.999	50.586	51.174	51.762
	DS	40.515	41.189	41.863	42.537	43.212	43.886	44.560	45.234	45.908	46.582
	LS	42.731	42.988	43.245	43.501	43.758	44.015	44.272	44.529	44.786	45.043
	NE	40.893	41.306	41.720	42.133	42.547	42.961	43.374	43.788	44.201	44.615
	NP	33.301	33.447	33.593	33.738	33.884	34.030	34.176	34.321	34.467	34.613
	SE	36.212	36.617	37.021	37.426	37.830	38.235	38.640	39.044	39.449	39.853
Total Supply (Mil. Bushels)	U.S.	3,618.60	3,704.72	3,755.13	3,828.86	3,893.93	3,965.34	4,032.91	4,102.73	4,171.11	4,240.14
Production (Mil. Bushels)	U.S.	3,429.98	3,446.72	3,497.13	3,570.86	3,635.93	3,707.34	3,774.91	3,844.73	3,913.11	3,982.14
Total Demand (Mil. Bushels)	U.S.	3,618.64	3,704.48	3,755.14	3,828.71	3,893.98	3,965.41	4,033.12	4,102.87	4,171.60	4,240.50
Seed, Feed and Residual (Mil. Bushels)	U.S.	86.977	93.838	90.104	93.823	95.617	99.607	102.676	106.462	109.981	113.587
Crushing (Mil. Bushels)	U.S.	1,876.21	1,914.02	1,941.07	1,976.32	2,009.55	2,045.44	2,080.41	2,116.23	2,151.91	2,187.63
Exports (Mil. Bushels)	U.S.	1,410.45	1,451.62	1,478.96	1,513.56	1,543.81	1,575.37	1,605.04	1,635.17	1,664.72	1,694.28

Table D-37 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	13.487	13.182	13.632	13.454	13.433	13.229	13.100	12.911	12.744	12.571
	CB	13.713	13.400	13.862	13.679	13.658	13.449	13.317	13.123	12.952	12.774
	CP	13.145	12.847	13.287	13.113	13.093	12.894	12.768	12.584	12.421	12.251
	DS	13.281	12.988	13.421	13.249	13.230	13.033	12.909	12.728	12.567	12.400
	LS	13.210	12.912	13.352	13.178	13.158	12.959	12.833	12.648	12.485	12.315
	NE	13.822	13.502	13.973	13.787	13.766	13.552	13.417	13.220	13.045	12.864
	NP	13.118	12.815	13.262	13.085	13.065	12.862	12.734	12.547	12.381	12.208
	SE	13.834	13.517	13.985	13.800	13.779	13.567	13.432	13.236	13.063	12.882
Loan Rate ($/Bushel)	U.S.	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
Target Price ($/Bushel)	U.S.	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	122.531	125.131	127.732	130.332	132.933	135.533	138.134	140.734	143.334	145.935
Expected Net Returns ($/Acre)	CB	464.839	554.072	541.707	567.269	561.185	563.061	555.403	551.498	544.341	538.180
	CP	331.609	499.914	491.019	516.912	513.732	517.871	513.120	511.803	507.385	503.836
	DS	488.720	427.123	421.378	445.670	444.824	450.309	448.006	448.660	446.545	445.145
	LS	477.735	453.516	441.488	461.230	454.487	454.402	446.402	441.549	434.031	427.369
	NE	482.789	454.227	444.159	466.786	462.115	464.312	458.234	455.387	449.691	444.837
	NP	349.385	325.880	315.049	329.342	322.702	321.323	313.725	308.618	301.436	294.943
	SE	432.063	389.997	381.375	401.573	397.698	399.882	394.741	392.448	387.619	383.523

Table D-38. Forecast Result for the U.S. Soybean Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	77.163	79.175	79.792	80.837	81.756	82.748	83.682	84.621	85.533	86.429
	CB	34.400	34.727	34.962	35.203	35.394	35.563	35.702	35.819	35.914	35.994
	CP	8.750	9.839	10.014	10.266	10.467	10.689	10.898	11.111	11.323	11.535
	DS	6.430	6.410	6.387	6.381	6.374	6.371	6.368	6.367	6.365	6.364
	LS	10.380	10.619	10.811	11.057	11.293	11.543	11.793	12.048	12.304	12.565
	NE	1.628	1.632	1.648	1.674	1.693	1.715	1.735	1.756	1.777	1.798
	NP	9.200	9.799	10.052	10.411	10.701	11.020	11.322	11.630	11.935	12.240
	SE	6.375	6.148	5.917	5.845	5.834	5.847	5.863	5.890	5.915	5.934
Harvested Acres (Mil. Acres)	U.S.	75.899	77.912	78.553	79.602	80.519	81.507	82.434	83.365	84.269	85.158
	CB	34.118	34.452	34.691	34.937	35.131	35.305	35.446	35.565	35.663	35.744
	CP	8.550	9.616	9.786	10.033	10.230	10.447	10.652	10.860	11.067	11.275
	DS	6.233	6.214	6.193	6.187	6.181	6.178	6.175	6.174	6.173	6.172
	LS	10.235	10.474	10.668	10.915	11.151	11.402	11.653	11.909	12.167	12.428
	NE	1.603	1.607	1.623	1.649	1.668	1.690	1.710	1.731	1.752	1.772
	NP	9.069	9.661	9.911	10.265	10.552	10.867	11.165	11.469	11.770	12.072
	SE	6.091	5.888	5.680	5.616	5.606	5.618	5.632	5.657	5.679	5.696
Yields (Bushels/Acre)	CB	48.498	48.901	49.305	49.708	50.112	50.516	50.919	51.323	51.726	52.130
	CP	46.472	47.060	47.647	48.235	48.823	49.411	49.999	50.586	51.174	51.762
	DS	40.515	41.189	41.863	42.537	43.212	43.886	44.560	45.234	45.908	46.582
	LS	42.731	42.988	43.245	43.501	43.758	44.015	44.272	44.529	44.786	45.043
	NE	40.893	41.306	41.720	42.133	42.547	42.961	43.374	43.788	44.201	44.615
	NP	33.301	33.447	33.593	33.738	33.884	34.030	34.176	34.321	34.467	34.613
	SE	36.212	36.617	37.021	37.426	37.830	38.235	38.640	39.044	39.449	39.853
Total Supply (Mil. Bushels)	U.S.	3,618.60	3,706.60	3,766.29	3,842.59	3,913.59	3,987.83	4,059.92	4,132.55	4,204.44	4,276.11
Production (Mil. Bushels)	U.S.	3,429.98	3,448.60	3,508.29	3,584.59	3,655.59	3,729.83	3,801.92	3,874.55	3,946.44	4,018.11
Total Demand (Mil. Bushels)	U.S.	3,618.95	3,706.59	3,766.24	3,842.60	3,913.69	3,987.23	4,059.68	4,132.13	4,204.37	4,275.76
Seed, Feed and Residual (Mil. Bushels)	U.S.	54.251	51.158	43.763	45.270	47.329	51.461	56.015	60.975	66.040	70.923
Crushing (Mil. Bushels)	U.S.	1,881.73	1,907.46	1,930.41	1,962.71	1,995.88	2,031.51	2,067.67	2,104.38	2,141.40	2,178.24
Exports (Mil. Bushels)	U.S.	1,437.97	1,502.97	1,547.07	1,589.62	1,625.48	1,659.25	1,690.99	1,721.78	1,751.94	1,781.60

Table D-38 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	15.689	16.360	17.224	17.265	17.233	17.006	16.734	16.423	16.102	15.799
	CB	15.970	16.659	17.545	17.587	17.553	17.321	17.042	16.723	16.395	16.083
	CP	15.295	15.951	16.794	16.834	16.803	16.581	16.315	16.012	15.699	15.403
	DS	15.401	16.047	16.879	16.918	16.887	16.668	16.406	16.107	15.799	15.507
	LS	15.362	16.019	16.863	16.903	16.872	16.650	16.384	16.080	15.767	15.470
	NE	16.125	16.827	17.731	17.774	17.740	17.502	17.218	16.893	16.558	16.240
	NP	15.306	15.974	16.832	16.873	16.841	16.615	16.345	16.036	15.717	15.416
	SE	16.124	16.822	17.721	17.763	17.730	17.494	17.211	16.888	16.554	16.239
Loan Rate ($/Bushel)	U.S.	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
Target Price ($/Bushel)	U.S.	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	122.531	125.131	127.732	130.332	132.933	135.533	138.134	140.734	143.334	145.935
Expected Net Returns ($/Acre)	CB	464.839	663.551	701.066	748.861	755.426	758.260	750.984	741.167	729.107	716.256
	CP	331.609	599.821	637.069	684.038	693.235	698.987	695.309	689.169	680.822	671.617
	DS	488.720	512.984	547.389	590.417	600.869	608.326	607.518	604.482	599.423	593.516
	LS	477.735	545.476	575.039	613.072	616.542	616.899	608.865	598.765	586.860	574.358
	NE	482.789	548.407	581.492	623.553	630.088	633.398	627.932	620.223	610.522	600.088
	NP	349.385	398.745	420.696	449.264	450.486	449.254	441.429	432.007	421.198	409.955
	SE	432.063	472.911	502.406	539.873	546.033	549.346	544.892	538.434	530.190	521.272

Table D-39. Forecast Result for the U.S. Soybean Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	77.163	78.271	78.915	79.587	80.505	81.396	82.328	83.273	84.233	85.199
	CB	34.400	34.530	34.695	34.838	35.003	35.158	35.310	35.454	35.590	35.720
	CP	8.750	9.656	9.921	10.139	10.393	10.622	10.854	11.082	11.309	11.535
	DS	6.430	6.368	6.337	6.316	6.311	6.312	6.317	6.324	6.332	6.341
	LS	10.380	10.385	10.452	10.523	10.646	10.789	10.959	11.151	11.365	11.600
	NE	1.628	1.610	1.637	1.658	1.684	1.707	1.730	1.753	1.775	1.798
	NP	9.200	9.555	9.927	10.236	10.597	10.924	11.258	11.585	11.913	12.240
	SE	6.375	6.168	5.945	5.876	5.870	5.885	5.900	5.925	5.949	5.966
Harvested Acres (Mil. Acres)	U.S.	75.899	77.012	77.673	78.348	79.261	80.146	81.070	82.007	82.959	83.917
	CB	34.118	34.251	34.419	34.565	34.733	34.891	35.046	35.193	35.332	35.464
	CP	8.550	9.436	9.696	9.909	10.158	10.381	10.609	10.831	11.054	11.275
	DS	6.233	6.175	6.146	6.127	6.122	6.123	6.127	6.134	6.142	6.150
	LS	10.235	10.240	10.308	10.379	10.502	10.646	10.816	11.009	11.223	11.459
	NE	1.603	1.585	1.612	1.633	1.659	1.682	1.705	1.727	1.750	1.772
	NP	9.069	9.420	9.787	10.092	10.449	10.772	11.101	11.425	11.749	12.072
	SE	6.091	5.905	5.706	5.644	5.639	5.652	5.665	5.688	5.709	5.725
Yields (Bushels/Acre)	CB	48.498	48.901	49.305	49.708	50.112	50.516	50.919	51.323	51.726	52.130
	CP	46.472	47.060	47.647	48.235	48.823	49.411	49.999	50.586	51.174	51.762
	DS	40.515	41.189	41.863	42.537	43.212	43.886	44.560	45.234	45.908	46.582
	LS	42.731	42.988	43.245	43.501	43.758	44.015	44.272	44.529	44.786	45.043
	NE	40.893	41.306	41.720	42.133	42.547	42.961	43.374	43.788	44.201	44.615
	NP	33.301	33.447	33.593	33.738	33.884	34.030	34.176	34.321	34.467	34.613
	SE	36.212	36.617	37.021	37.426	37.830	38.235	38.640	39.044	39.449	39.853
Total Supply (Mil. Bushels)	U.S.	3,618.60	3,668.25	3,727.31	3,786.76	3,856.51	3,925.65	3,997.08	4,069.61	4,143.38	4,218.05
Production (Mil. Bushels)	U.S.	3,429.98	3,410.25	3,469.31	3,528.76	3,598.51	3,667.65	3,739.08	3,811.61	3,885.38	3,960.05
Total Demand (Mil. Bushels)	U.S.	3,618.63	3,668.26	3,727.32	3,786.71	3,856.75	3,926.13	3,997.23	4,069.66	4,143.38	4,217.69
Seed, Feed and Residual (Mil. Bushels)	U.S.	69.716	58.630	52.461	48.446	49.774	52.180	55.969	60.747	66.323	72.312
Crushing (Mil. Bushels)	U.S.	1,880.16	1,898.06	1,922.12	1,949.02	1,981.25	2,014.73	2,049.82	2,086.06	2,123.27	2,161.14
Exports (Mil. Bushels)	U.S.	1,423.76	1,466.57	1,507.73	1,544.24	1,580.73	1,614.22	1,646.44	1,677.86	1,708.79	1,739.23

Table D-39 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	14.638	15.975	16.727	17.280	17.332	17.265	17.067	16.774	16.406	16.002
	CB	14.893	16.264	17.035	17.602	17.655	17.586	17.383	17.083	16.706	16.291
	CP	14.269	15.575	16.309	16.849	16.900	16.834	16.641	16.355	15.996	15.601
	DS	14.389	15.676	16.400	16.932	16.983	16.918	16.727	16.445	16.091	15.702
	LS	14.336	15.642	16.377	16.918	16.969	16.903	16.710	16.423	16.064	15.668
	NE	15.026	16.424	17.211	17.789	17.844	17.773	17.566	17.260	16.875	16.452
	NP	14.262	15.591	16.338	16.887	16.940	16.873	16.676	16.384	16.019	15.617
	SE	15.032	16.422	17.204	17.779	17.833	17.763	17.557	17.252	16.870	16.449
Loan Rate ($/Bushel)	U.S.	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000	6.000
Target Price ($/Bushel)	U.S.	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557	11.557
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	122.531	125.131	127.732	130.332	132.933	135.533	138.134	140.734	143.334	145.935
Expected Net Returns ($/Acre)	CB	464.839	611.316	681.750	723.731	756.169	763.374	764.413	758.573	747.556	732.354
	CP	331.609	552.154	619.367	660.910	693.922	703.732	707.818	705.445	698.140	686.784
	DS	488.720	472.018	532.116	570.386	601.466	612.466	618.471	618.781	614.688	606.929
	LS	477.735	501.600	558.852	592.059	617.162	621.157	620.020	613.192	602.120	587.646
	NE	482.789	503.472	564.846	601.859	630.731	637.828	639.583	635.350	626.581	614.123
	NP	349.385	363.980	407.891	432.668	450.975	452.606	450.198	443.330	433.156	420.352
	SE	432.063	433.351	487.736	520.734	546.601	553.262	555.201	551.830	544.426	533.725

Table D-40. Forecast Result for the U.S. Soybean Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	77.163	79.218	79.720	80.772	81.625	82.613	83.501	84.427	85.308	86.188
	CB	34.400	34.731	34.944	35.178	35.351	35.513	35.640	35.751	35.840	35.915
	CP	8.750	9.838	9.998	10.261	10.453	10.680	10.886	11.103	11.314	11.528
	DS	6.430	6.411	6.384	6.377	6.367	6.364	6.360	6.358	6.356	6.355
	LS	10.380	10.625	10.795	11.031	11.242	11.476	11.703	11.939	12.174	12.414
	NE	1.628	1.633	1.646	1.673	1.691	1.714	1.734	1.755	1.775	1.796
	NP	9.200	9.811	10.032	10.405	10.681	11.008	11.303	11.615	11.916	12.225
	SE	6.375	6.168	5.921	5.847	5.839	5.857	5.875	5.906	5.933	5.953
Harvested Acres (Mil. Acres)	U.S.	75.899	77.953	78.482	79.537	80.388	81.369	82.252	83.169	84.042	84.913
	CB	34.118	34.456	34.673	34.912	35.088	35.253	35.383	35.496	35.587	35.664
	CP	8.550	9.615	9.771	10.028	10.216	10.439	10.640	10.853	11.058	11.269
	DS	6.233	6.216	6.191	6.184	6.175	6.171	6.168	6.166	6.164	6.163
	LS	10.235	10.481	10.652	10.888	11.101	11.335	11.563	11.800	12.035	12.277
	NE	1.603	1.608	1.621	1.648	1.666	1.689	1.709	1.730	1.750	1.771
	NP	9.069	9.672	9.890	10.259	10.531	10.855	11.146	11.454	11.752	12.057
	SE	6.091	5.906	5.684	5.618	5.611	5.627	5.643	5.671	5.695	5.713
Yields (Bushels/Acre)	CB	48.498	48.901	49.305	49.708	50.112	50.516	50.919	51.323	51.726	52.130
	CP	46.472	47.060	47.647	48.235	48.823	49.411	49.999	50.586	51.174	51.762
	DS	40.515	41.189	41.863	42.537	43.212	43.886	44.560	45.234	45.908	46.582
	LS	42.731	42.988	43.245	43.501	43.758	44.015	44.272	44.529	44.786	45.043
	NE	40.893	41.306	41.720	42.133	42.547	42.961	43.374	43.788	44.201	44.615
	NP	33.301	33.447	33.593	33.738	33.884	34.030	34.176	34.321	34.467	34.613
	SE	36.212	36.617	37.021	37.426	37.830	38.235	38.640	39.044	39.449	39.853
Total Supply (Mil. Bushels)	U.S.	3618.60	3708.13	3763.20	3839.64	3907.68	3981.48	4051.50	4123.38	4193.76	4264.54
Production (Mil. Bushels)	U.S.	3429.98	3450.13	3505.20	3581.64	3649.68	3723.48	3793.50	3865.38	3935.76	4006.54
Total Demand (Mil. Bushels)	U.S.	3618.67	3708.08	3763.20	3839.88	3907.79	3981.29	4051.49	4123.26	4193.92	4264.60
Seed, Feed and Residual (Mil. Bushels)	U.S.	69.774	72.758	67.429	70.827	72.816	77.336	81.288	85.979	90.412	94.925
Crushing (Mil. Bushels)	U.S.	1880.03	1912.61	1937.52	1971.89	2005.04	2041.19	2076.84	2113.39	2149.84	2186.34
Exports (Mil. Bushels)	U.S.	1423.86	1477.72	1513.25	1552.17	1584.94	1617.76	1648.36	1678.90	1708.67	1738.331

Table D-40 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	14.626	14.708	15.343	15.205	15.175	14.922	14.714	14.441	14.190	13.933
	CB	14.881	14.965	15.616	15.475	15.444	15.185	14.971	14.692	14.434	14.171
	CP	14.258	14.338	14.958	14.823	14.794	14.547	14.344	14.077	13.832	13.581
	DS	14.378	14.457	15.068	14.935	14.907	14.663	14.463	14.200	13.958	13.711
	LS	14.324	14.404	15.025	14.890	14.861	14.614	14.410	14.143	13.898	13.647
	NE	15.013	15.099	15.763	15.619	15.588	15.323	15.105	14.820	14.557	14.289
	NP	14.250	14.332	14.963	14.826	14.796	14.545	14.338	14.067	13.817	13.562
	SE	15.019	15.105	15.765	15.621	15.590	15.327	15.111	14.827	14.566	14.299
Loan Rate ($/Bushel)	U.S.	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reference Price ($/Bushel)	U.S.	8.400	8.400	8.400	8.400	8.400	8.400	8.400	8.400	8.400	8.400
Price Loss Coverage ($/Bushel)	U.S.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	122.531	125.131	127.732	130.332	132.933	135.533	138.134	140.734	143.334	145.935
Agricultural Risk Coverage ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Expected Net Returns ($/Acre)	CB	464.839	599.159	606.699	642.218	638.883	641.003	631.541	624.187	613.276	603.282
	CP	331.609	540.049	549.618	584.970	584.658	589.355	583.253	579.027	571.385	564.506
	DS	488.720	459.990	470.351	503.067	504.971	511.203	507.972	506.315	501.588	497.459
	LS	477.735	489.539	494.083	522.007	517.395	517.350	507.690	499.823	489.053	479.089
	NE	482.789	491.399	498.571	529.910	527.743	530.281	522.767	517.046	508.199	500.113
	NP	349.385	352.023	354.240	374.913	369.863	368.423	359.428	351.867	342.053	332.897
	SE	432.063	421.340	427.956	455.899	454.303	456.854	450.509	445.734	438.172	431.265

Table D-41. Forecast Result for the U.S. Soybean Meal Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (lbs/Bushel of SB)	U.S.	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000
Total Supply (Mil. Short Tons)	U.S.	45.037	45.795	46.387	47.189	47.976	48.825	49.669	50.530	51.393	52.254
Production (Mil. Short Tons)	U.S.	44.591	45.345	45.937	46.739	47.526	48.375	49.219	50.080	50.943	51.804
Total Demand (Mil. Short Tons)	U.S.	45.037	45.793	46.387	47.190	47.977	48.823	49.668	50.530	51.392	52.256
Domestic (Mil. Short Tons)	U.S.	35.386	36.000	36.536	37.172	37.800	38.456	39.112	39.775	40.439	41.103
Exports (Mil. Short Tons)	U.S.	9.351	9.493	9.551	9.718	9.877	10.067	10.257	10.455	10.653	10.852
Farm Price ($/Short Ton)	U.S.	495.075	494.382	504.985	501.068	498.243	491.321	484.483	476.518	468.448	460.342
Crushing Margins ($/Bushel of Soybeans)	U.S.	1.107	1.164	0.981	1.105	1.206	1.395	1.572	1.765	1.955	2.135

Table D-42. Forecast Result for the U.S. Soybean Meal Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (lbs/Bushel of SB)	U.S.	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000
Total Supply (Mil. Short Tons)	U.S.	44.946	45.848	46.490	47.328	48.117	48.969	49.800	50.650	51.498	52.346
Production (Mil. Short Tons)	U.S.	44.500	45.398	46.040	46.878	47.667	48.519	49.350	50.200	51.048	51.896
Total Demand (Mil. Short Tons)	U.S.	44.946	45.845	46.490	47.326	48.117	48.969	49.800	50.652	51.499	52.350
Domestic (Mil. Short Tons)	U.S.	35.799	36.478	37.034	37.683	38.310	38.966	39.612	40.267	40.921	41.577
Exports (Mil. Short Tons)	U.S.	8.847	9.067	9.156	9.343	9.508	9.704	9.889	10.084	10.278	10.473
Farm Price ($/Short Ton)	U.S.	434.789	424.546	432.189	426.417	423.797	416.870	411.437	404.570	397.972	391.144
Crushing Margins ($/Bushel of Soybeans)	U.S.	0.883	1.117	1.026	1.179	1.272	1.438	1.577	1.734	1.884	2.030

Table D-43. Forecast Result for the U.S. Soybean Meal Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (lbs/Bushel of SB)	U.S.	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000
Total Supply (Mil. Short Tons)	U.S.	45.077	45.692	46.237	47.004	47.792	48.638	49.497	50.369	51.248	52.123
Production (Mil. Short Tons)	U.S.	44.631	45.242	45.787	46.554	47.342	48.188	49.047	49.919	50.798	51.673
Total Demand (Mil. Short Tons)	U.S.	45.079	45.692	46.237	47.004	47.793	48.635	49.495	50.367	51.247	52.122
Domestic (Mil. Short Tons)	U.S.	35.025	35.566	36.074	36.689	37.315	37.966	38.626	39.292	39.961	40.629
Exports (Mil. Short Tons)	U.S.	9.754	9.826	9.863	10.015	10.178	10.369	10.569	10.775	10.985	11.193
Farm Price ($/Short Ton)	U.S.	547.834	557.783	572.476	571.554	569.106	562.896	555.385	547.057	538.220	529.628
Crushing Margins ($/Bushel of Soybeans)	U.S.	1.258	1.100	0.807	0.887	1.003	1.218	1.446	1.687	1.929	2.156

Table D-44. Forecast Result for the U.S. Soybean Meal Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (lbs/Bushel of SB)	U.S.	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000
Total Supply (Mil. Short Tons)	U.S.	45.040	45.469	46.040	46.679	47.445	48.240	49.073	49.934	50.818	51.717
Production (Mil. Short Tons)	U.S.	44.594	45.019	45.590	46.229	46.995	47.790	48.623	49.484	50.368	51.267
Total Demand (Mil. Short Tons)	U.S.	45.040	45.469	46.040	46.677	47.447	48.243	49.075	49.935	50.818	51.715
Domestic (Mil. Short Tons)	U.S.	35.388	35.846	36.372	36.929	37.549	38.181	38.830	39.493	40.167	40.847
Exports (Mil. Short Tons)	U.S.	9.352	9.323	9.369	9.449	9.599	9.762	9.945	10.142	10.352	10.568
Farm Price ($/Short Ton)	U.S.	494.888	516.885	529.015	536.590	534.964	531.571	525.618	517.746	508.254	497.833
Crushing Margins ($/Bushel of Soybeans)	U.S.	1.113	0.674	0.415	0.258	0.334	0.465	0.664	0.904	1.174	1.454

Table D-45. Forecast Result for the U.S. Soybean Meal Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (lbs/Bushel of SB)	U.S.	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000
Total Supply (Mil. Short Tons)	U.S.	44.591	45.364	45.956	46.772	47.560	48.418	49.265	50.133	50.999	51.866
Production (Mil. Short Tons)	U.S.	45.037	45.814	46.406	47.222	48.010	48.868	49.715	50.583	51.449	52.316
Total Demand (Mil. Short Tons)	U.S.	45.037	45.813	46.406	47.224	48.011	48.867	49.714	50.583	51.448	52.318
Domestic (Mil. Short Tons)	U.S.	35.386	36.009	36.545	37.188	37.816	38.477	39.133	39.800	40.465	41.133
Exports (Mil. Short Tons)	U.S.	9.350	9.504	9.561	9.736	9.895	10.090	10.281	10.483	10.683	10.885
Farm Price ($/Short Ton)	U.S.	0.495	0.493	0.504	0.499	0.496	0.488	0.481	0.473	0.465	0.456
Crushing Margins ($/Bushel of Soybeans)	U.S.	1.107	1.191	1.010	1.153	1.254	1.454	1.631	1.830	2.019	2.202

Table D-46. Forecast Result for the U.S. Soybean Oil Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (lbs/Bushel of SB)	U.S.	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000
Total Supply (Bil. Pounds)	U.S.	27.194	27.382	27.720	28.177	28.627	29.111	29.593	30.085	30.577	31.069
Production (Bil. Pounds)	U.S.	24.331	24.762	25.100	25.557	26.007	26.491	26.973	27.465	27.957	28.449
Total Demand (Bil. Pounds)	U.S.	27.194	27.382	27.720	28.177	28.627	29.111	29.593	30.085	30.577	31.069
Domestic (Bil. Pounds)	U.S.	19.488	19.606	19.744	19.971	20.191	20.423	20.654	20.894	21.131	21.374
Exports (Bil. Pounds)	U.S.	2.210	2.161	2.114	2.098	2.079	2.063	2.046	2.031	2.015	2.000
Farm Price ($/Pound)	U.S.	0.418	0.438	0.457	0.468	0.481	0.492	0.504	0.515	0.526	0.537
Crushing Margins ($/Bushel of Soybeans)	U.S.	1.107	1.164	0.981	1.105	1.206	1.395	1.572	1.765	1.955	2.135

Table D-47. Forecast Result for the U.S. Soybean Oil Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (lbs/Bushel of SB)	U.S.	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000
Total Supply (Bil. Pounds)	U.S.	27.142	27.412	27.779	28.257	28.707	29.194	29.668	30.153	30.637	31.121
Production (Bil. Pounds)	U.S.	24.279	24.792	25.159	25.637	26.087	26.574	27.048	27.533	28.017	28.501
Total Demand (Bil. Pounds)	U.S.	27.142	27.412	27.779	28.257	28.707	29.194	29.668	30.153	30.637	31.121
Domestic (Bil. Pounds)	U.S.	19.494	19.672	19.830	20.070	20.289	20.522	20.747	20.982	21.212	21.449
Exports (Bil. Pounds)	U.S.	2.152	2.124	2.086	2.077	2.059	2.045	2.027	2.011	1.993	1.976
Farm Price ($/Pound)	U.S.	0.417	0.431	0.448	0.458	0.470	0.481	0.493	0.504	0.516	0.527
Crushing Margins ($/Bushel of Soybeans)	U.S.	0.883	1.117	1.026	1.179	1.272	1.438	1.577	1.734	1.884	2.030

Table D-48. Forecast Result for the U.S. Soybean Oil Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (lbs/Bushel of SB)	U.S.	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000
Total Supply (Bil. Pounds)	U.S.	27.217	27.323	27.634	28.072	28.522	29.005	29.495	29.993	30.495	30.994
Production (Bil. Pounds)	U.S.	24.354	24.703	25.014	25.452	25.902	26.385	26.875	27.373	27.875	28.374
Total Demand (Bil. Pounds)	U.S.	27.217	27.323	27.634	28.072	28.522	29.005	29.495	29.993	30.495	30.994
Domestic (Bil. Pounds)	U.S.	19.460	19.516	19.640	19.855	20.077	20.310	20.547	20.792	21.037	21.286
Exports (Bil. Pounds)	U.S.	2.261	2.189	2.133	2.111	2.090	2.073	2.057	2.043	2.029	2.016
Farm Price ($/Pound)	U.S.	0.420	0.446	0.468	0.481	0.494	0.505	0.517	0.527	0.538	0.549
Crushing Margins ($/Bushel of Soybeans)	U.S.	1.258	1.100	0.807	0.887	1.003	1.218	1.446	1.687	1.929	2.156

Table D-49. Forecast Result for the U.S. Soybean Oil Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (lbs/Bushel of SB)	U.S.	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000
Total Supply (Bil. Pounds)	U.S.	27.196	27.196	27.522	27.886	28.323	28.777	29.253	29.744	30.249	30.762
Production (Bil. Pounds)	U.S.	24.333	24.576	24.902	25.266	25.703	26.157	26.633	27.124	27.629	28.142
Total Demand (Bil. Pounds)	U.S.	27.196	27.196	27.522	27.886	28.323	28.777	29.253	29.744	30.249	30.762
Domestic (Bil. Pounds)	U.S.	19.465	19.419	19.566	19.721	19.929	20.158	20.394	20.639	20.891	21.148
Exports (Bil. Pounds)	U.S.	2.202	2.091	2.042	1.991	1.962	1.940	1.921	1.905	1.892	1.881
Farm Price ($/Pound)	U.S.	0.420	0.456	0.476	0.497	0.512	0.525	0.537	0.548	0.559	0.569
Crushing Margins ($/Bushel of Soybeans)	U.S.	1.113	0.674	0.415	0.258	0.334	0.465	0.664	0.904	1.174	1.454

Table D-50. Forecast Result for the U.S. Soybean Oil Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (lbs/Bushel of SB)	U.S.	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000
Total Supply (Bil. Pounds)	U.S.	27.194	27.393	27.730	28.196	28.646	29.136	29.619	30.115	30.609	31.104
Production (Bil. Pounds)	U.S.	24.331	24.773	25.110	25.576	26.026	26.516	26.999	27.495	27.989	28.484
Total Demand (Bil. Pounds)	U.S.	27.194	27.393	27.730	28.196	28.646	29.136	29.619	30.115	30.609	31.104
Domestic (Bil. Pounds)	U.S.	19.488	19.614	19.752	19.984	20.204	20.440	20.672	20.914	21.152	21.397
Exports (Bil. Pounds)	U.S.	2.210	2.164	2.117	2.104	2.084	2.071	2.054	2.041	2.025	2.011
Farm Price ($/Pound)	U.S.	0.418	0.437	0.456	0.467	0.479	0.490	0.501	0.512	0.523	0.534
Crushing Margins ($/Bushel of Soybeans)	U.S.	1.107	1.191	1.010	1.153	1.254	1.454	1.631	1.830	2.019	2.202

Table D-51. Forecast Result for the U.S. Wheat Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	56.530	57.599	57.509	57.224	56.677	56.055	55.573	55.203	54.818	54.407
	CB	3.166	3.583	3.716	3.737	3.725	3.690	3.678	3.674	3.669	3.660
	CP	13.069	13.147	12.945	12.626	12.280	11.895	11.570	11.281	11.006	10.730
	DS	1.380	1.396	1.401	1.404	1.404	1.404	1.404	1.404	1.404	1.404
	FW	5.372	5.819	5.726	5.654	5.566	5.486	5.435	5.391	5.336	5.273
	LS	2.190	2.297	2.334	2.339	2.336	2.323	2.319	2.321	2.325	2.329
	NP	15.213	15.932	15.912	15.906	15.735	15.574	15.446	15.367	15.280	15.191
	SE	3.535	3.315	3.172	3.115	3.086	3.066	3.049	3.054	3.060	3.062
	SP	11.830	12.109	12.302	12.444	12.544	12.617	12.671	12.710	12.739	12.759
Harvested Acres (Mil. Acres)	U.S.	47.886	49.545	49.441	49.175	48.677	48.115	47.679	47.346	46.998	46.626
	CB	2.890	3.255	3.371	3.388	3.378	3.348	3.337	3.333	3.329	3.321
	CP	12.082	12.152	11.970	11.685	11.375	11.030	10.739	10.480	10.233	9.986
	DS	1.231	1.247	1.251	1.253	1.254	1.254	1.254	1.254	1.254	1.254
	FW	4.977	5.419	5.327	5.256	5.169	5.090	5.040	4.996	4.942	4.879
	LS	2.125	2.223	2.256	2.261	2.258	2.246	2.243	2.244	2.248	2.251
	NP	14.674	15.311	15.294	15.289	15.137	14.994	14.881	14.811	14.733	14.654
	SE	2.944	2.720	2.576	2.517	2.488	2.468	2.450	2.456	2.462	2.464
	SP	6.962	7.218	7.396	7.526	7.619	7.686	7.735	7.771	7.797	7.816
Yields (Bushels/Acre)	CB	61.357	61.820	62.283	62.747	63.210	63.674	64.137	64.600	65.064	65.527
	CP	39.918	40.111	40.304	40.496	40.689	40.881	41.074	41.267	41.459	41.652
	DS	57.347	58.122	58.898	59.674	60.450	61.226	62.001	62.777	63.553	64.329
	FW	69.986	70.487	70.989	71.490	71.991	72.492	72.993	73.494	73.995	74.496
	LS	60.057	60.935	61.813	62.690	63.567	64.445	65.323	66.200	67.077	67.955
	NP	38.633	39.032	39.431	39.830	40.229	40.628	41.027	41.426	41.825	42.224
	SE	63.969	65.083	66.197	67.311	68.425	69.539	70.653	71.767	72.881	73.995
	SP	34.049	34.244	34.440	34.635	34.830	35.026	35.221	35.417	35.612	35.807
Total Supply (Mil. Bushels)	U.S.	3,021.51	3,242.91	3,232.41	3,258.15	3,262.70	3,243.32	3,242.28	3,247.14	3,250.09	3,251.19
Production (Mil. Bushels)	U.S.	2,198.51	2,300.39	2,311.99	2,317.09	2,312.35	2,304.53	2,303.32	2,307.31	2,310.29	2,311.65
Total Demand (Mil. Bushels)	U.S.	3,021.51	3,242.91	3,232.41	3,258.15	3,262.69	3,243.32	3,242.28	3,247.15	3,250.09	3,251.19
Seed (Mil. Bushels)	U.S.	77.089	76.962	76.558	75.785	74.907	74.226	73.703	73.159	72.579	72.010
Feed and Residual (Mil. Bushels)	U.S.	174.115	363.479	322.210	334.592	344.538	326.874	326.389	331.617	335.121	327.741
Food (Mil. Bushels)	U.S.	953.285	959.691	965.287	972.492	979.463	985.435	990.297	994.806	998.989	1,003.25
Exports (Mil. Bushels)	U.S.	988.22	1,033.42	1,036.77	1,036.90	1,036.97	1,029.47	1,023.28	1,019.02	1,015.47	1,008.15

Table D-51 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	8.438	6.831	6.506	6.279	6.054	6.061	6.028	5.936	5.822	5.823
	CB	7.463	6.069	5.787	5.591	5.396	5.402	5.373	5.293	5.195	5.196
	CP	8.239	6.660	6.340	6.118	5.897	5.904	5.871	5.780	5.668	5.670
	DS	7.257	5.971	5.710	5.529	5.349	5.355	5.328	5.254	5.163	5.164
	FW	8.605	7.010	6.687	6.462	6.239	6.246	6.213	6.121	6.008	6.010
	LS	8.480	6.848	6.517	6.287	6.058	6.066	6.032	5.938	5.822	5.824
	NP	9.168	9.168	7.023	6.771	6.522	6.530	6.493	6.390	6.264	6.265
	SE	7.389	6.025	5.749	5.557	5.366	5.372	5.344	5.265	5.169	5.170
	SP	8.390	6.772	6.444	6.216	5.989	5.996	5.963	5.870	5.755	5.757
Loan Rate ($/Bushel)	U.S.	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205
Target Price ($/Bushel)	U.S.	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	100.267	102.418	104.569	106.721	108.872	111.023	113.175	115.326	117.477	119.628
Expected Net Returns ($/Acre)	CB	332.168	372.819	288.002	271.086	259.299	247.412	248.153	246.657	241.829	235.702
	CP	189.315	243.839	179.928	166.165	156.223	146.255	145.525	143.168	138.406	132.725
	DS	274.986	331.075	259.810	246.946	238.412	229.668	232.015	232.368	229.715	225.844
	FW	462.399	517.168	406.907	385.332	370.465	355.480	356.966	355.536	349.769	342.316
	LS	376.325	424.254	330.056	313.469	302.614	291.451	295.082	296.046	292.983	288.276
	NP	207.306	269.114	201.001	187.548	178.188	168.695	169.466	168.406	164.603	159.711
	SE	318.186	387.613	304.930	291.201	282.519	273.495	277.741	279.580	277.762	274.428
	SP	131.415	200.594	144.674	132.557	123.768	114.942	114.212	112.053	107.777	102.687

Table D-52. Forecast Result for the U.S. Wheat Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	56.530	57.439	56.855	56.273	55.565	54.896	54.420	54.068	53.669	53.227
	CB	3.166	3.566	3.666	3.669	3.662	3.638	3.640	3.643	3.642	3.633
	CP	13.069	13.099	12.774	12.342	11.930	11.500	11.157	10.851	10.552	10.244
	DS	1.380	1.396	1.400	1.402	1.402	1.402	1.402	1.403	1.403	1.403
	FW	5.372	5.805	5.645	5.551	5.459	5.386	5.342	5.300	5.241	5.172
	LS	2.190	2.289	2.307	2.299	2.292	2.279	2.280	2.286	2.293	2.299
	NP	15.213	15.866	15.614	15.484	15.224	15.042	14.914	14.853	14.770	14.685
	SE	3.535	3.311	3.156	3.095	3.068	3.049	3.033	3.042	3.050	3.054
	SP	11.830	12.107	12.293	12.430	12.527	12.599	12.651	12.691	12.718	12.738
Harvested Acres (Mil. Acres)	U.S.	47.886	49.401	48.849	48.316	47.675	47.070	46.641	46.324	45.964	45.563
	CB	2.890	3.240	3.326	3.329	3.324	3.302	3.304	3.307	3.306	3.298
	CP	12.082	12.109	11.818	11.431	11.062	10.677	10.369	10.095	9.827	9.551
	DS	1.231	1.246	1.250	1.252	1.252	1.252	1.252	1.253	1.253	1.253
	FW	4.977	5.405	5.247	5.155	5.064	4.991	4.948	4.906	4.848	4.780
	LS	2.125	2.215	2.232	2.224	2.218	2.206	2.207	2.212	2.219	2.224
	NP	14.674	15.253	15.029	14.914	14.684	14.523	14.409	14.355	14.281	14.206
	SE	2.944	2.717	2.559	2.497	2.470	2.450	2.434	2.443	2.451	2.455
	SP	6.962	7.216	7.388	7.514	7.603	7.669	7.717	7.753	7.779	7.797
Yields (Bushels/Acre)	CB	61.357	61.820	62.283	62.747	63.210	63.674	64.137	64.600	65.064	65.527
	CP	39.918	40.111	40.304	40.496	40.689	40.881	41.074	41.267	41.459	41.652
	DS	57.347	58.122	58.898	59.674	60.450	61.226	62.001	62.777	63.553	64.329
	FW	69.986	70.487	70.989	71.490	71.991	72.492	72.993	73.494	73.995	74.496
	LS	60.057	60.935	61.813	62.690	63.567	64.445	65.323	66.200	67.077	67.955
	NP	38.633	39.032	39.431	39.830	40.229	40.628	41.027	41.426	41.825	42.224
	SE	63.969	65.083	66.197	67.311	68.425	69.539	70.653	71.767	72.881	73.995
	SP	34.049	34.244	34.440	34.635	34.830	35.026	35.221	35.417	35.612	35.807
Total Supply (Mil. Bushels)	U.S.	3,021.51	3,236.20	3,204.42	3,217.84	3,216.23	3,195.21	3,194.67	3,200.27	3,202.45	3,201.91
Production (Mil. Bushels)	U.S.	2,198.51	2,293.68	2,284.00	2,276.78	2,265.88	2,256.42	2,255.71	2,260.44	2,262.65	2,262.37
Total Demand (Mil. Bushels)	U.S.	3,021.51	3,236.19	3,204.42	3,217.84	3,216.22	3,195.21	3,194.68	3,200.28	3,202.46	3,201.91
Seed (Mil. Bushels)	U.S.	76.863	76.037	75.214	74.215	73.269	72.597	72.100	71.536	70.912	70.297
Feed and Residual (Mil. Bushels)	U.S.	229.421	403.838	340.420	341.783	346.914	327.563	327.279	332.960	335.739	326.833
Food (Mil. Bushels)	U.S.	955.68	967.22	976.74	987.00	995.95	1,003.38	1,009.29	1,014.74	1,019.67	1,024.57
Exports (Mil. Bushels)	U.S.	930.743	979.733	980.461	976.459	973.274	964.352	957.409	952.499	948.210	940.181

Table D-52 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	7.494	5.770	5.525	5.425	5.300	5.351	5.341	5.268	5.177	5.200
	CB	6.644	5.150	4.938	4.851	4.742	4.786	4.777	4.715	4.636	4.656
	CP	7.311	5.618	5.377	5.278	5.155	5.205	5.195	5.124	5.034	5.057
	DS	6.501	5.122	4.926	4.846	4.745	4.786	4.778	4.720	4.647	4.665
	FW	7.668	5.957	5.714	5.615	5.491	5.541	5.531	5.459	5.368	5.391
	LS	7.521	5.770	5.521	5.419	5.292	5.344	5.333	5.260	5.167	5.191
	NP	8.119	6.207	5.935	5.824	5.685	5.741	5.730	5.650	5.548	5.574
	SE	6.588	5.125	4.917	4.832	4.726	4.769	4.760	4.699	4.621	4.641
	SP	7.439	5.704	5.457	5.356	5.230	5.281	5.271	5.198	5.106	5.129
Loan Rate ($/Bushel)	U.S.	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205
Target Price ($/Bushel)	U.S.	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	100.267	102.418	104.569	106.721	108.872	111.023	113.175	115.326	117.477	119.628
Expected Net Returns ($/Acre)	CB	332.168	322.581	231.156	218.163	212.852	206.093	208.929	208.438	204.451	199.333
	CP	189.315	206.787	138.115	127.342	122.241	116.103	116.976	115.422	111.339	106.453
	DS	274.986	287.732	210.474	200.749	197.637	193.192	197.199	198.263	196.186	193.052
	FW	462.399	451.564	332.702	316.276	309.882	301.605	305.842	305.740	301.086	294.963
	LS	376.325	366.624	264.388	251.914	248.229	242.752	248.555	250.427	248.092	244.333
	NP	207.306	228.615	155.048	144.651	140.440	135.026	137.423	137.105	133.915	129.778
	SE	318.186	336.337	246.341	236.136	233.741	229.707	235.804	238.364	237.111	234.545
	SP	131.415	168.215	108.101	98.568	93.991	88.498	89.152	87.677	83.977	79.566

Table D-53. Forecast Result for the U.S. Wheat Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	56.530	57.726	57.998	57.955	57.564	57.018	56.555	56.183	55.811	55.425
	CB	3.166	3.599	3.758	3.795	3.784	3.744	3.721	3.710	3.701	3.690
	CP	13.069	13.186	13.071	12.840	12.553	12.212	11.910	11.638	11.382	11.130
	DS	1.380	1.397	1.403	1.405	1.406	1.406	1.406	1.406	1.406	1.406
	FW	5.372	5.831	5.789	5.737	5.657	5.577	5.522	5.475	5.423	5.365
	LS	2.190	2.305	2.356	2.374	2.376	2.365	2.359	2.359	2.360	2.362
	NP	15.213	15.981	16.128	16.220	16.130	16.003	15.888	15.803	15.715	15.625
	SE	3.535	3.317	3.185	3.130	3.102	3.081	3.064	3.067	3.071	3.072
	SP	11.830	12.111	12.308	12.453	12.556	12.631	12.685	12.725	12.754	12.774
Harvested Acres (Mil. Acres)	U.S.	47.886	49.660	49.884	49.836	49.478	48.983	48.564	48.229	47.893	47.543
	CB	2.890	3.268	3.407	3.439	3.429	3.394	3.375	3.365	3.357	3.348
	CP	12.082	12.187	12.084	11.877	11.619	11.314	11.043	10.800	10.570	10.345
	DS	1.231	1.247	1.252	1.255	1.255	1.255	1.255	1.255	1.255	1.255
	FW	4.977	5.431	5.390	5.338	5.259	5.180	5.126	5.080	5.028	4.970
	LS	2.125	2.230	2.276	2.293	2.295	2.284	2.279	2.279	2.280	2.282
	NP	14.674	15.355	15.485	15.567	15.487	15.374	15.272	15.197	15.119	15.039
	SE	2.944	2.723	2.588	2.532	2.504	2.483	2.466	2.468	2.472	2.473
	SP	6.962	7.220	7.402	7.535	7.630	7.698	7.748	7.785	7.811	7.830
Yields (Bushels/Acre)	CB	61.357	61.820	62.283	62.747	63.210	63.674	64.137	64.600	65.064	65.527
	CP	39.918	40.111	40.304	40.496	40.689	40.881	41.074	41.267	41.459	41.652
	DS	57.347	58.122	58.898	59.674	60.450	61.226	62.001	62.777	63.553	64.329
	FW	69.986	70.487	70.989	71.490	71.991	72.492	72.993	73.494	73.995	74.496
	LS	60.057	60.935	61.813	62.690	63.567	64.445	65.323	66.200	67.077	67.955
	NP	38.633	39.032	39.431	39.830	40.229	40.628	41.027	41.426	41.825	42.224
	SE	63.969	65.083	66.197	67.311	68.425	69.539	70.653	71.767	72.881	73.995
	SP	34.049	34.244	34.440	34.635	34.830	35.026	35.221	35.417	35.612	35.807
Total Supply (Mil. Bushels)	U.S.	3,021.51	3,248.30	3,253.56	3,289.50	3,300.34	3,283.92	3,283.54	3,288.26	3,291.89	3,294.29
Production (Mil. Bushels)	U.S.	2,198.51	2,305.78	2,333.13	2,348.44	2,349.99	2,345.14	2,344.58	2,348.43	2,352.10	2,354.75
Total Demand (Mil. Bushels)	U.S.	3,021.52	3,248.30	3,253.57	3,289.50	3,300.33	3,283.93	3,283.54	3,288.27	3,291.90	3,294.28
Seed (Mil. Bushels)	U.S.	77.268	77.652	77.591	77.039	76.267	75.614	75.087	74.562	74.016	73.486
Feed and Residual (Mil. Bushels)	U.S.	118.333	323.318	299.386	320.646	335.255	320.308	320.528	325.752	329.916	323.873
Food (Mil. Bushels)	U.S.	951.357	953.532	955.645	959.898	964.763	969.131	972.819	976.305	979.651	983.166
Exports (Mil. Bushels)	U.S.	1,045.76	1,084.44	1,089.36	1,093.54	1,097.23	1,091.56	1,086.50	1,083.11	1,080.38	1,073.72

Table D-53 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	9.381	7.974	7.600	7.249	6.913	6.865	6.797	6.678	6.539	6.520
	CB	8.280	7.060	6.736	6.432	6.141	6.098	6.040	5.937	5.816	5.800
	CP	9.166	7.783	7.416	7.071	6.741	6.693	6.626	6.510	6.373	6.354
	DS	8.011	6.885	6.586	6.305	6.036	5.997	5.943	5.848	5.737	5.722
	FW	9.540	8.144	7.773	7.425	7.092	7.043	6.976	6.858	6.720	6.701
	LS	9.438	8.008	7.629	7.272	6.931	6.882	6.813	6.692	6.551	6.532
	NP	10.214	8.652	8.237	7.848	7.475	7.421	7.346	7.214	7.060	7.039
	SE	8.189	6.995	6.678	6.380	6.095	6.054	5.996	5.895	5.777	5.761
	SP	9.339	7.922	7.546	7.192	6.854	6.805	6.737	6.617	6.477	6.458
Loan Rate ($/Bushel)	U.S.	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205
Target Price ($/Bushel)	U.S.	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	100.267	102.418	104.569	106.721	108.872	111.023	113.175	115.326	117.477	119.628
Expected Net Returns ($/Acre)	CB	332.168	422.956	349.221	330.172	312.063	294.492	292.488	289.400	283.393	276.141
	CP	189.315	280.816	224.956	209.508	194.827	180.610	177.793	174.199	168.505	161.936
	DS	274.986	374.331	312.940	298.523	284.733	271.229	271.365	270.510	266.999	262.306
	FW	462.399	582.640	486.819	462.430	439.289	416.866	414.751	411.227	403.904	394.967
	LS	376.325	481.769	400.775	382.192	364.396	346.939	347.669	347.066	342.900	337.135
	NP	207.306	309.532	250.488	235.441	221.071	207.057	205.684	203.412	198.728	192.994
	SE	318.186	438.786	368.025	352.680	337.931	323.387	325.141	325.676	322.966	318.773
	SP	131.415	232.909	184.060	170.503	157.595	145.073	142.537	139.315	134.243	128.394

Table D-54. Forecast Result for the U.S. Wheat Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	56.530	57.134	56.981	56.577	56.149	55.608	55.216	54.905	54.585	54.235
	CB	3.166	3.602	3.736	3.779	3.765	3.727	3.699	3.675	3.649	3.620
	CP	13.069	13.189	13.015	12.778	12.479	12.137	11.816	11.507	11.192	10.863
	DS	1.380	1.394	1.398	1.400	1.401	1.401	1.402	1.402	1.403	1.404
	FW	5.372	5.752	5.692	5.625	5.578	5.522	5.484	5.451	5.405	5.349
	LS	2.190	2.307	2.346	2.364	2.363	2.351	2.342	2.333	2.324	2.314
	NP	15.213	15.471	15.317	15.068	14.922	14.772	14.736	14.754	14.796	14.848
	SE	3.535	3.318	3.185	3.134	3.110	3.092	3.077	3.079	3.082	3.082
	SP	11.830	12.100	12.292	12.429	12.531	12.605	12.661	12.702	12.733	12.756
Harvested Acres (Mil. Acres)	U.S.	47.886	49.126	48.971	48.602	48.216	47.728	47.374	47.093	46.804	46.485
	CB	2.890	3.271	3.388	3.425	3.413	3.380	3.355	3.335	3.312	3.287
	CP	12.082	12.189	12.033	11.821	11.553	11.247	10.959	10.683	10.400	10.105
	DS	1.231	1.244	1.248	1.250	1.251	1.251	1.252	1.252	1.253	1.253
	FW	4.977	5.353	5.294	5.228	5.181	5.125	5.088	5.055	5.010	4.954
	LS	2.125	2.232	2.267	2.284	2.283	2.272	2.263	2.256	2.247	2.238
	NP	14.674	14.903	14.766	14.546	14.416	14.284	14.252	14.267	14.305	14.351
	SE	2.944	2.724	2.588	2.536	2.512	2.494	2.478	2.481	2.484	2.483
	SP	6.962	7.211	7.386	7.513	7.607	7.674	7.726	7.764	7.793	7.814
Yields (Bushels/Acre)	CB	61.357	61.820	62.283	62.747	63.210	63.674	64.137	64.600	65.064	65.527
	CP	39.918	40.111	40.304	40.496	40.689	40.881	41.074	41.267	41.459	41.652
	DS	57.347	58.122	58.898	59.674	60.450	61.226	62.001	62.777	63.553	64.329
	FW	69.986	70.487	70.989	71.490	71.991	72.492	72.993	73.494	73.995	74.496
	LS	60.057	60.935	61.813	62.690	63.567	64.445	65.323	66.200	67.077	67.955
	NP	38.633	39.032	39.431	39.830	40.229	40.628	41.027	41.426	41.825	42.224
	SE	63.969	65.083	66.197	67.311	68.425	69.539	70.653	71.767	72.881	73.995
	SP	34.049	34.244	34.440	34.635	34.830	35.026	35.221	35.417	35.612	35.807
Total Supply (Mil. Bushels)	U.S.	3,021.51	3,225.16	3,213.86	3,236.44	3,246.68	3,230.92	3,233.08	3,239.62	3,244.39	3,247.09
Production (Mil. Bushels)	U.S.	2,198.51	2,282.64	2,293.44	2,295.38	2,296.32	2,292.14	2,294.12	2,299.79	2,304.59	2,307.54
Total Demand (Mil. Bushels)	U.S.	3,021.51	3,225.16	3,213.86	3,236.43	3,246.69	3,230.91	3,233.08	3,239.61	3,244.40	3,247.09
Seed (Mil. Bushels)	U.S.	76.431	76.215	75.645	75.040	74.276	73.722	73.282	72.830	72.336	71.845
Feed and Residual (Mil. Bushels)	U.S.	181.218	358.381	320.021	329.908	343.931	328.237	329.202	334.399	338.199	331.310
Food (Mil. Bushels)	U.S.	959.93	968.44	977.52	984.99	992.23	997.44	1,001.31	1,004.29	1,006.63	1,008.78
Exports (Mil. Bushels)	U.S.	975.13	1,012.76	1,009.10	1,008.11	1,009.44	1,004.19	1,000.68	999.56	999.29	995.13

Table D-54 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	8.839	7.464	7.353	7.161	6.898	6.836	6.720	6.532	6.318	6.222
	CB	7.810	6.618	6.522	6.355	6.127	6.073	5.974	5.810	5.624	5.542
	CP	8.633	7.282	7.173	6.984	6.725	6.664	6.551	6.366	6.155	6.062
	DS	7.577	6.477	6.388	6.234	6.024	5.974	5.882	5.731	5.560	5.483
	FW	9.003	7.638	7.528	7.337	7.076	7.014	6.900	6.713	6.500	6.406
	LS	8.888	7.491	7.378	7.183	6.915	6.852	6.735	6.544	6.326	6.229
	NP	9.613	8.086	7.964	7.750	7.458	7.389	7.261	7.052	6.814	6.708
	SE	7.729	6.562	6.468	6.305	6.082	6.029	5.931	5.771	5.589	5.509
	SP	8.793	7.409	7.297	7.103	6.838	6.776	6.660	6.470	6.254	6.159
Loan Rate ($/Bushel)	U.S.	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205	15.205
Target Price ($/Bushel)	U.S.	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170	4.170
Counter-cyclical Payments ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	100.267	102.418	104.569	106.721	108.872	111.023	113.175	115.326	117.477	119.628
Expected Net Returns ($/Acre)	CB	332.168	394.142	321.907	316.863	307.256	293.624	290.893	285.153	275.218	263.661
	CP	189.315	259.565	204.866	199.745	191.310	179.977	176.632	171.116	162.585	152.921
	DS	274.986	349.472	289.235	286.906	280.512	270.463	269.950	266.720	259.666	251.053
	FW	462.399	545.013	451.165	445.064	433.018	415.735	412.673	405.694	393.257	378.718
	LS	376.325	448.715	369.222	366.712	358.767	345.917	345.778	341.997	333.083	322.056
	NP	207.306	286.303	228.409	224.653	217.164	206.350	204.382	199.934	192.017	182.722
	SE	318.186	409.377	339.874	338.832	332.883	322.468	323.436	321.096	314.076	305.087
	SP	131.415	214.338	166.487	161.956	154.513	144.518	141.518	136.607	129.038	120.460

Table D-55. Forecast Result for the U.S. Wheat Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	56.530	57.560	57.365	57.014	56.396	55.730	55.222	54.846	54.442	54.009
	CB	3.166	3.575	3.698	3.712	3.700	3.665	3.657	3.656	3.653	3.646
	CP	13.069	13.116	12.860	12.484	12.090	11.657	11.302	10.987	10.688	10.385
	DS	1.380	1.397	1.401	1.404	1.404	1.404	1.404	1.404	1.404	1.404
	FW	5.372	5.803	5.715	5.648	5.561	5.484	5.435	5.393	5.337	5.273
	LS	2.190	2.295	2.328	2.331	2.327	2.314	2.313	2.317	2.324	2.330
	NP	15.213	15.948	15.887	15.876	15.682	15.522	15.392	15.322	15.235	15.148
	SE	3.535	3.317	3.175	3.118	3.091	3.071	3.055	3.061	3.067	3.070
	SP	11.830	12.109	12.300	12.441	12.541	12.613	12.666	12.705	12.733	12.753
Harvested Acres (Mil. Acres)	U.S.	47.898	49.520	49.323	48.998	48.438	47.835	47.377	47.038	46.674	46.282
	CB	2.890	3.247	3.355	3.367	3.356	3.325	3.318	3.318	3.316	3.309
	CP	12.082	12.124	11.894	11.557	11.205	10.817	10.499	10.217	9.949	9.677
	DS	1.231	1.247	1.251	1.253	1.254	1.254	1.254	1.254	1.254	1.254
	FW	4.977	5.404	5.316	5.250	5.164	5.088	5.039	4.998	4.943	4.880
	LS	2.125	2.221	2.251	2.253	2.250	2.238	2.237	2.241	2.247	2.253
	NP	14.674	15.326	15.271	15.262	15.090	14.948	14.833	14.771	14.694	14.616
	SE	2.956	2.734	2.589	2.531	2.504	2.484	2.467	2.473	2.480	2.482
	SP	6.962	7.218	7.394	7.524	7.615	7.682	7.730	7.767	7.792	7.811
Yields (Bushels/Acre)	CB	61.357	61.820	62.283	62.747	63.210	63.674	64.137	64.600	65.064	65.527
	CP	39.918	40.111	40.304	40.496	40.689	40.881	41.074	41.267	41.459	41.652
	DS	57.347	58.122	58.898	59.674	60.450	61.226	62.001	62.777	63.553	64.329
	FW	69.986	70.487	70.989	71.490	71.991	72.492	72.993	73.494	73.995	74.496
	LS	60.057	60.935	61.813	62.690	63.567	64.445	65.323	66.200	67.077	67.955
	NP	38.633	39.032	39.431	39.830	40.229	40.628	41.027	41.426	41.825	42.224
	SE	63.969	65.083	66.197	67.311	68.425	69.539	70.653	71.767	72.881	73.995
	SP	34.049	34.244	34.440	34.635	34.830	35.026	35.221	35.417	35.612	35.807
Total Supply (Mil. Bushels)	U.S.	3022.27	3241.55	3227.23	3250.59	3252.62	3231.64	3229.82	3234.62	3236.93	3237.22
Production (Mil. Bushels)	U.S.	2199.27	2299.03	2306.80	2309.53	2302.27	2292.85	2290.86	2294.79	2297.13	2297.68
Total Demand (Mil. Bushels)	U.S.	3022.27	3241.54	3227.23	3250.59	3252.62	3231.64	3229.83	3234.62	3236.94	3237.22
Seed (Mil. Bushels)	U.S.	77.033	76.757	76.261	75.389	74.447	73.730	73.198	72.628	72.016	71.418
Feed and Residual (Mil. Bushels)	U.S.	174.686	362.548	318.393	329.388	337.730	319.350	318.681	324.157	327.334	319.544
Food (Mil. Bushels)	U.S.	953.310	959.997	965.471	972.574	979.172	984.812	989.256	993.438	997.284	1001.25
Exports (Mil. Bushels)	U.S.	988.45	1032.88	1035.52	1034.86	1034.45	1026.43	1020.08	1015.86	1012.37	1004.97

Table D-55 (Continued)

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Farm Price ($/Bushel)	U.S.	7.457	6.084	5.821	5.645	5.463	5.483	5.458	5.377	5.277	5.280
	CB	8.233	6.676	6.378	6.179	5.972	5.995	5.967	5.875	5.762	5.765
	CP	7.251	5.984	5.741	5.579	5.411	5.429	5.406	5.332	5.239	5.242
	DS	8.598	7.026	6.725	6.524	6.316	6.338	6.310	6.218	6.103	6.106
	FW	8.474	6.864	6.556	6.350	6.137	6.160	6.131	6.037	5.919	5.923
	LS	9.160	7.402	7.065	6.841	6.607	6.633	6.601	6.498	6.369	6.374
	NP	7.383	6.039	5.782	5.610	5.431	5.451	5.427	5.348	5.249	5.253
	SE	8.383	6.788	6.483	6.279	6.067	6.090	6.062	5.968	5.851	5.855
	SP	8.431	6.848	6.544	6.342	6.131	6.154	6.126	6.033	5.917	5.921
Loan Rate ($/Bushel)	U.S.	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940	2.940
Loan Deficiency Payments ($/Bushel)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reference Price ($/Bushel)	U.S.	5.500	5.500	5.500	5.500	5.500	5.500	5.500	5.500	5.500	5.500
Price Loss Coverage ($/Bushel)	U.S.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	100.267	102.418	104.569	106.721	108.872	111.023	113.175	115.326	117.477	119.628
Agricultural Risk Coverage ($/Acre)	CB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	CP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	DS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	FW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	LS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	NP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Expected Net Returns ($/Acre)	CB	332.168	357.249	273.677	257.959	247.487	236.436	238.080	236.898	232.056	225.854
	CP	189.315	228.365	165.370	152.485	143.500	134.136	134.055	131.917	127.135	121.389
	DS	274.986	315.556	245.368	233.556	226.186	218.197	221.364	222.022	219.383	215.469
	FW	462.399	501.487	392.851	372.839	359.686	345.789	348.450	347.427	341.639	334.085
	LS	376.325	408.631	315.868	300.681	291.382	281.231	285.963	287.342	284.302	279.543
	NP	207.306	253.615	186.507	174.028	165.741	156.936	158.453	157.661	153.859	148.915
	SE	318.186	372.036	290.632	278.159	270.877	262.772	268.022	270.248	268.465	265.097
	SP	131.415	185.155	130.035	118.687	110.738	102.444	102.285	100.322	96.031	90.887

Table D-56. Forecast Result for the U.S. Peanut Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	1.142	1.134	1.117	1.101	1.085	1.078	1.070	1.057	1.044	1.033
	SE	0.969	0.923	0.910	0.899	0.887	0.877	0.866	0.854	0.843	0.831
Harvested Acres (Mil. Acres)	U.S.	1.068	1.022	1.009	0.997	0.986	0.975	0.964	0.953	0.941	0.930
	SE	0.948	0.902	0.889	0.877	0.866	0.855	0.844	0.833	0.821	0.810
Yields (Pounds/Acre)	SE	3,240.73	3,267.25	3,293.78	3,320.30	3,346.83	3,373.35	3,399.88	3,426.41	3,452.93	3,479.46
Total Supply (Mil. Pounds)	U.S.	5,172.36	5,032.95	5,048.73	4,970.90	4,878.99	4,838.08	4,913.47	4,888.49	4,846.28	4,822.94
Production (Mil. Pounds)	U.S.	3,600.34	3,461.15	3,382.77	3,411.75	3,387.81	3,365.86	3,361.41	3,340.37	3,321.74	3,305.32
Total Demand (Mil. Pounds)	U.S.	5,172.36	5,032.95	5,048.73	4,970.90	4,878.99	4,838.08	4,913.47	4,888.49	4,846.28	4,822.94
Seed and Residual (Mil. Pounds)	U.S.	520.033	528.531	537.029	545.527	554.025	562.523	571.021	579.519	588.017	596.515
Crushing (Mil. Pounds)	U.S.	418.335	393.927	389.658	381.649	368.539	352.589	345.340	335.578	324.340	312.944
Food (Mil. Pounds)	U.S.	2,368.39	2,305.44	2,361.12	2,371.37	2,361.14	2,335.03	2,376.50	2,390.35	2,392.76	2,397.57
Exports (Mil. Pounds)	U.S.	363.803	209.097	271.766	251.175	193.070	105.869	142.490	128.493	93.541	62.998
Farm Price ($/Pound)	U.S.	0.316	0.353	0.320	0.314	0.320	0.336	0.311	0.303	0.301	0.298
	SE	0.320	0.360	0.325	0.318	0.325	0.341	0.315	0.307	0.305	0.302
Loan Rate ($/Pound)	U.S.	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177
Loan Deficiency Payments ($/Pound)	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869
Target Price ($/Pound)	U.S.	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248
Counter-cyclical Payments ($/Acre)	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.881	451.747	457.613	463.480	469.346	475.212	481.078	486.944	492.811	498.677
Expected Net Returns ($/Acre)	SE	841.658	638.024	768.730	658.184	639.750	663.648	721.242	636.625	609.582	606.673

Table D-57. Forecast Result for the U.S. Peanut Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	1.142	1.135	1.117	1.101	1.086	1.079	1.071	1.058	1.046	1.034
	SE	0.969	0.924	0.910	0.899	0.888	0.878	0.868	0.856	0.844	0.833
Harvested Acres (Mil. Acres)	U.S.	1.068	1.023	1.009	0.997	0.986	0.976	0.966	0.954	0.943	0.931
	SE	0.948	0.903	0.889	0.877	0.866	0.856	0.846	0.834	0.823	0.811
Yields (Pounds/Acre)	SE	3,240.73	3,267.25	3,293.78	3,320.30	3,346.83	3,373.35	3,399.88	3,426.41	3,452.93	3,479.46
Total Supply (Mil. Pounds)	U.S.	5,172.36	5,036.10	5,049.08	4,971.70	4,880.81	4,841.64	4,919.28	4,893.94	4,851.68	4,828.60
Production (Mil. Pounds)	U.S.	3,600.34	3,464.30	3,383.12	3,412.55	3,389.63	3,369.42	3,367.22	3,345.82	3,327.14	3,310.97
Total Demand (Mil. Pounds)	U.S.	5,172.36	5,036.10	5,049.08	4,971.69	4,880.81	4,841.64	4,919.28	4,893.94	4,851.69	4,828.60
Seed and Residual (Mil. Pounds)	U.S.	520.033	528.531	537.029	545.527	554.025	562.523	571.021	579.519	588.017	596.515
Crushing (Mil. Pounds)	U.S.	421.850	397.573	393.188	385.197	372.129	356.252	349.096	339.319	328.079	316.694
Food (Mil. Pounds)	U.S.	2,397.07	2,335.18	2,389.93	2,400.32	2,390.44	2,364.92	2,407.15	2,420.88	2,423.27	2,428.17
Exports (Mil. Pounds)	U.S.	331.607	178.854	239.788	219.471	162.002	75.882	113.898	99.678	64.699	34.310
Farm Price ($/Pound)	U.S.	0.299	0.335	0.303	0.297	0.303	0.318	0.293	0.284	0.283	0.280
	SE	0.302	0.341	0.307	0.300	0.307	0.322	0.296	0.288	0.286	0.283
Loan Rate ($/Pound)	U.S.	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177
Loan Deficiency Payments ($/Pound)	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869
Target Price ($/Pound)	U.S.	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248
Counter-cyclical Payments ($/Acre)	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.881	451.747	457.613	463.480	469.346	475.212	481.078	486.944	492.811	498.677
Expected Net Returns ($/Acre)	SE	841.658	580.146	708.209	599.114	579.895	602.591	658.462	571.739	544.450	541.068

Table D-58. Forecast Result for the U.S. Peanut Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	1.142	1.133	1.117	1.100	1.085	1.077	1.069	1.056	1.043	1.032
	SE	0.969	0.923	0.910	0.898	0.887	0.876	0.865	0.853	0.842	0.830
Harvested Acres (Mil. Acres)	U.S.	1.068	1.021	1.009	0.997	0.985	0.974	0.963	0.952	0.940	0.929
	SE	0.948	0.901	0.889	0.877	0.865	0.854	0.843	0.832	0.820	0.809
Yields (Pounds/Acre)	SE	3,240.73	3,267.25	3,293.78	3,320.30	3,346.83	3,373.35	3,399.88	3,426.41	3,452.93	3,479.46
Total Supply (Mil. Pounds)	U.S.	5,172.36	5,031.23	5,048.40	4,970.29	4,877.78	4,835.90	4,909.99	4,884.95	4,842.60	4,819.05
Production (Mil. Pounds)	U.S.	3,600.34	3,459.43	3,382.44	3,411.14	3,386.60	3,363.68	3,357.93	3,336.83	3,318.05	3,301.42
Total Demand (Mil. Pounds)	U.S.	5,172.36	5,031.23	5,048.40	4,970.29	4,877.78	4,835.90	4,909.99	4,884.95	4,842.59	4,819.04
Seed and Residual (Mil. Pounds)	U.S.	520.033	528.531	537.029	545.527	554.025	562.523	571.021	579.519	588.017	596.515
Crushing (Mil. Pounds)	U.S.	414.820	390.341	386.130	378.108	364.973	348.984	341.681	331.916	320.672	309.268
Food (Mil. Pounds)	U.S.	2,339.71	2,276.17	2,332.33	2,342.481	2,332.05	2,305.61	2,346.64	2,360.47	2,362.83	2,367.57
Exports (Mil. Pounds)	U.S.	396.000	240.229	303.758	282.993	224.513	136.717	172.528	158.497	123.452	92.778
Farm Price ($/Pound)	U.S.	0.333	0.371	0.337	0.331	0.337	0.353	0.329	0.320	0.319	0.316
	SE	0.338	0.378	0.343	0.336	0.343	0.359	0.334	0.325	0.324	0.321
Loan Rate ($/Pound)	U.S.	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177
Loan Deficiency Payments ($/Pound)	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869
Target Price ($/Pound)	U.S.	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248
Counter-cyclical Payments ($/Acre)	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.881	451.747	457.613	463.480	469.346	475.212	481.078	486.944	492.811	498.677
Expected Net Returns ($/Acre)	SE	841.658	695.902	828.264	717.239	699.478	724.279	783.035	699.840	673.330	671.023

Table D-59. Forecast Result for the U.S. Peanut Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	1.142	1.134	1.117	1.100	1.085	1.077	1.069	1.055	1.043	1.031
	SE	0.969	0.923	0.910	0.898	0.887	0.876	0.865	0.853	0.841	0.830
Harvested Acres (Mil. Acres)	U.S.	1.068	1.022	1.009	0.997	0.985	0.974	0.963	0.951	0.940	0.928
	SE	0.948	0.902	0.889	0.877	0.865	0.854	0.843	0.831	0.820	0.808
Yields (Pounds/Acre)	SE	3,240.73	3,267.25	3,293.78	3,320.30	3,346.83	3,373.35	3,399.88	3,426.41	3,452.93	3,479.46
Total Supply (Mil. Pounds)	U.S.	5,172.36	5,032.95	5,048.50	4,970.42	4,877.84	4,835.85	4,909.64	4,884.12	4,841.45	4,817.85
Production (Mil. Pounds)	U.S.	3,600.34	3,461.15	3,382.54	3,411.26	3,386.66	3,363.63	3,357.57	3,336.00	3,316.90	3,300.22
Total Demand (Mil. Pounds)	U.S.	5,172.36	5,032.95	5,048.50	4,970.42	4,877.84	4,835.85	4,909.64	4,884.12	4,841.45	4,817.85
Seed and Residual (Mil. Pounds)	U.S.	520.033	528.531	537.029	545.527	554.025	562.523	571.021	579.519	588.017	596.515
Crushing (Mil. Pounds)	U.S.	418.335	393.927	389.649	381.629	368.491	352.497	345.181	335.396	324.140	312.733
Food (Mil. Pounds)	U.S.	2,368.39	2,305.44	2,361.05	2,371.21	2,360.75	2,334.28	2,375.21	2,388.87	2,391.12	2,395.85
Exports (Mil. Pounds)	U.S.	363.803	209.097	271.624	250.874	192.354	104.491	140.113	125.785	90.546	59.840
Farm Price ($/Pound)	U.S.	0.316	0.353	0.320	0.314	0.320	0.336	0.312	0.303	0.302	0.299
	SE	0.320	0.360	0.325	0.319	0.325	0.342	0.316	0.308	0.306	0.303
Loan Rate ($/Pound)	U.S.	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177
Loan Deficiency Payments ($/Pound)	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Direct Payments ($/Acre)	U.S.	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869	45.869
Target Price ($/Pound)	U.S.	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248
Counter-cyclical Payments ($/Acre)	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.881	451.747	457.613	463.480	469.346	475.212	481.078	486.944	492.811	498.677
Expected Net Returns ($/Acre)	SE	841.658	638.024	768.730	658.343	640.090	664.462	722.822	639.372	612.736	610.187

Table D-60. Forecast Result for the U.S. Peanut Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Planted Acres (Mil. Acres)	U.S.	1.142	1.134	1.116	1.100	1.085	1.078	1.070	1.056	1.044	1.033
	SE	0.969	0.923	0.910	0.898	0.887	0.876	0.866	0.854	0.843	0.831
Harvested Acres (Mil. Acres)	U.S.	1.068	1.022	1.009	0.997	0.986	0.975	0.965	0.953	0.941	0.930
	SE	0.948	0.902	0.889	0.877	0.866	0.855	0.844	0.832	0.821	0.810
Yields (Pounds/Acre)	SE	3,240.73	3,267.25	3,293.78	3,320.30	3,346.83	3,373.35	3,399.88	3,426.41	3,452.93	3,479.46
Total Supply (Mil. Pounds)	U.S.	5172.360	5032.167	5048.360	4970.418	4878.396	4837.412	4912.885	4887.887	4845.737	4822.458
Production (Mil. Pounds)	U.S.	3600.341	3460.367	3382.400	3411.266	3387.213	3365.193	3360.823	3339.772	3321.191	3304.833
Total Demand (Mil. Pounds)	U.S.	5172.360	5032.167	5048.361	4970.418	4878.396	4837.413	4912.886	4887.887	4845.731	4822.459
Seed and Residual (Mil. Pounds)	U.S.	520.033	528.531	537.029	545.527	554.025	562.523	571.021	579.519	588.017	596.515
Crushing (Mil. Pounds)	U.S.	418.335	393.895	389.643	381.629	368.514	352.562	345.316	335.553	324.317	312.924
Food (Mil. Pounds)	U.S.	2368.388	2305.170	2360.999	2371.206	2360.938	2334.807	2376.306	2390.146	2392.571	2397.407
Exports (Mil. Pounds)	U.S.	363.803	208.612	271.537	250.874	192.699	105.458	142.128	128.123	93.201	62.699
Farm Price ($/Pound)	U.S.	0.316	0.353	0.320	0.314	0.320	0.336	0.311	0.303	0.301	0.298
	SE	0.320	0.360	0.325	0.319	0.325	0.341	0.315	0.307	0.305	0.302
Loan Rate ($/Pound)	U.S.	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177
Loan Deficiency Payments ($/Pound)	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reference Price ($/Pound)	U.S.	0.243	0.243	0.243	0.243	0.243	0.243	0.243	0.243	0.243	0.243
Price Loss Coverage ($/Pound)	U.S.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Agricultural Risk Coverage ($/Acre)	SE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Production Costs ($/Acre)	U.S.	445.881	451.747	457.613	463.480	469.346	475.212	481.078	486.944	492.811	498.677
Expected Net Returns ($/Acre)	SE	841.658	592.154	723.400	612.570	594.220	618.201	675.843	591.174	564.144	561.202

Table D-61. Forecast Result for the U.S. Ethanol Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (Gallons/Bushel of Corn)	DM	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750
	WM	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650
Total Supply (Bil. Gallons)	U.S.	11.531	12.049	12.531	12.912	13.362	13.767	14.209	14.636	15.071	15.459
Production (Bil. Gallons)	DM	9.456	9.408	9.840	10.172	10.571	10.926	11.318	11.695	12.080	12.418
	WM	1.351	1.376	1.407	1.436	1.466	1.496	1.526	1.556	1.586	1.615
Domestic Demand (Bil. Gallons)	U.S.	11.057	11.547	12.007	12.379	12.811	13.204	13.629	14.041	14.460	14.839
Net Exports (Bil. Gallons)	U.S.	-0.126	-0.098	-0.075	-0.067	-0.049	-0.037	-0.020	-0.005	0.011	0.020
Price ($/Gallon)	U.S.	2.837	2.747	2.676	2.663	2.611	2.584	2.537	2.498	2.454	2.437
Crushing Margins ($/Bushel of corn)	DM	1.211	1.005	0.989	0.933	0.904	0.857	0.825	0.787	0.752	0.699
	WM	1.349	1.097	1.101	1.036	1.014	0.980	0.948	0.915	0.885	0.831

Table D-62. Forecast Result for the U.S. Ethanol Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (Gallons/Bushel of Corn)	DM	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750
	WM	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650
Total Supply (Bil. Gallons)	U.S.	11.585	12.117	12.611	12.991	13.446	13.848	14.291	14.716	15.150	15.536
Production (Bil. Gallons)	DM	9.510	9.476	9.918	10.250	10.654	11.006	11.400	11.774	12.158	12.494
	WM	1.352	1.377	1.408	1.437	1.467	1.497	1.527	1.557	1.587	1.616
Domestic Demand (Bil. Gallons)	U.S.	11.104	11.606	12.075	12.447	12.883	13.274	13.700	14.110	14.528	14.905
Net Exports (Bil. Gallons)	U.S.	-0.118	-0.089	-0.064	-0.056	-0.037	-0.026	-0.009	0.006	0.022	0.031
Price ($/Gallon)	U.S.	2.806	2.708	2.631	2.618	2.564	2.539	2.491	2.453	2.410	2.394
Crushing Margins ($/Bushel of corn)	DM	1.232	1.032	1.020	0.964	0.936	0.889	0.857	0.818	0.783	0.728
	WM	1.378	1.130	1.138	1.072	1.052	1.017	0.986	0.950	0.921	0.866

Table D-63. Forecast Result for the U.S. Ethanol Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (Gallons/Bushel of Corn)	DM	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750
	WM	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650
Total Supply (Bil. Gallons)	U.S.	11.478	11.985	12.454	12.835	13.280	13.687	14.127	14.557	14.992	15.382
Production (Bil. Gallons)	DM	9.403	9.345	9.763	10.095	10.490	10.847	11.237	11.617	12.002	12.342
	WM	1.351	1.375	1.406	1.435	1.465	1.495	1.525	1.555	1.585	1.615
Domestic Demand (Bil. Gallons)	U.S.	11.011	11.492	11.940	12.313	12.740	13.136	13.559	13.974	14.392	14.772
Net Exports (Bil. Gallons)	U.S.	-0.133	-0.107	-0.086	-0.078	-0.060	-0.048	-0.032	-0.016	0.000	0.009
Price ($/Gallon)	U.S.	2.867	2.783	2.720	2.706	2.658	2.630	2.583	2.542	2.499	2.481
Crushing Margins ($/Bushel of corn)	DM	1.190	0.981	0.959	0.903	0.872	0.826	0.793	0.756	0.721	0.669
	WM	1.323	1.069	1.066	1.003	0.978	0.946	0.913	0.881	0.850	0.797

Table D-64. Forecast Result for the U.S. Ethanol Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (Gallons/Bushel of Corn)	DM	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750
	WM	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650
Total Supply (Bil. Gallons)	U.S.	13.938	14.589	15.171	15.237	15.295	15.355	15.418	15.480	15.542	15.594
Production (Bil. Gallons)	DM	11.842	11.924	12.456	12.475	12.486	12.500	12.516	12.531	12.547	12.552
	WM	1.372	1.399	1.430	1.457	1.484	1.511	1.537	1.564	1.590	1.617
Domestic Demand (Bil. Gallons)	U.S.	13.800	14.400	15.000	15.000	15.000	15.000	15.000	15.000	15.000	15.000
Net Exports (Bil. Gallons)	U.S.	-0.462	-0.411	-0.429	-0.363	-0.305	-0.245	-0.182	-0.120	-0.058	-0.006
Price ($/Gallon)	U.S.	4.200	4.017	4.107	3.862	3.649	3.426	3.194	2.963	2.732	2.544
Crushing Margins ($/Bushel of corn)	DM	2.148	1.995	2.017	1.839	1.657	1.476	1.296	1.116	0.935	0.751
	WM	2.225	2.056	2.081	1.915	1.743	1.586	1.412	1.244	1.074	0.895

Table D-65. Forecast Result for the U.S. Ethanol Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (Gallons/Bushel of Corn)	DM	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750
	WM	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650
Total Supply (Bil. Gallons)	U.S.	11531.2	12035.9	12529.2	12902.9	13359.2	13760.4	14205.5	14631.3	15067.7	15454.8
Production (Bil. Gallons)	DM	9456.0	9395.3	9837.7	10162.2	10568.3	10919.5	11314.7	11690.5	12076.9	12414.6
	WM	1351.2	1375.6	1406.6	1435.7	1466.0	1495.8	1525.9	1555.8	1585.8	1615.2
Domestic Demand (Bil. Gallons)	U.S.	11531.2	12035.9	12529.2	12902.9	13359.2	13760.4	14205.5	14631.3	15067.7	15454.8
Net Exports (Bil. Gallons)	U.S.	-125.60	-99.89	-75.76	-68.30	-49.33	-38.04	-20.62	-5.92	10.29	19.62
Price ($/Gallon)	U.S.	2.837	2.754	2.677	2.668	2.613	2.588	2.539	2.501	2.456	2.440
Crushing Margins ($/Bushel of corn)	DM	1.211	1.000	0.988	0.929	0.903	0.855	0.824	0.785	0.751	0.697
	WM	1.349	1.090	1.099	1.030	1.011	0.976	0.945	0.911	0.882	0.827

Table D-66. Forecast Result for the U.S. Biodiesel Sector under the Baseline

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (Gallons/Pound of SB Oil)	U.S.	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133
Total Supply (Bil. Gallons)	U.S.	0.562	0.597	0.643	0.689	0.736	0.785	0.836	0.885	0.936	0.985
Production (Bil. Gallons)	U.S.	0.560	0.582	0.628	0.674	0.721	0.770	0.821	0.870	0.921	0.970
Domestic Demand (Bil. Gallons)	U.S.	0.454	0.523	0.581	0.638	0.694	0.753	0.812	0.869	0.928	0.982
Net Exports (Bil. Gallons)	U.S.	0.073	0.059	0.047	0.036	0.026	0.017	0.009	0.001	-0.006	-0.012
Price ($/Gallon)	U.S.	4.739	4.394	4.290	4.120	3.977	4.000	4.037	4.051	4.119	4.110
Crushing Margins ($/Pound of SB Oil)	U.S.	2.371	0.864	0.604	0.339	0.093	0.023	-0.038	-0.116	-0.145	-0.247

Table D-67. Forecast Result for the U.S. Biodiesel Sector under the U.S. Dollar Appreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (Gallons/Pound of SB Oil)	U.S.	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133
Total Supply (Bil. Gallons)	U.S.	0.562	0.597	0.643	0.689	0.736	0.786	0.836	0.886	0.936	0.986
Production (Bil. Gallons)	U.S.	0.560	0.582	0.628	0.674	0.721	0.771	0.821	0.871	0.921	0.971
Domestic Demand (Bil. Gallons)	U.S.	0.454	0.523	0.581	0.638	0.694	0.753	0.812	0.869	0.928	0.982
Net Exports (Bil. Gallons)	U.S.	0.073	0.059	0.047	0.036	0.027	0.018	0.009	0.002	-0.005	-0.012
Price ($/Gallon)	U.S.	4.733	4.366	4.230	4.050	3.908	3.931	3.966	3.984	4.052	4.050
Crushing Margins ($/Pound of SB Oil)	U.S.	2.369	0.883	0.609	0.347	0.106	0.038	-0.027	-0.103	-0.135	-0.233

Table D-68. Forecast Result for the U.S. Biodiesel Sector under the U.S. Dollar Depreciation

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (Gallons/Pound of SB Oil)	U.S.	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133
Total Supply (Bil. Gallons)	U.S.	0.562	0.597	0.643	0.689	0.735	0.785	0.835	0.885	0.936	0.985
Production (Bil. Gallons)	U.S.	0.560	0.582	0.628	0.674	0.720	0.770	0.820	0.870	0.921	0.970
Domestic Demand (Bil. Gallons)	U.S.	0.454	0.523	0.581	0.638	0.694	0.753	0.812	0.869	0.928	0.982
Net Exports (Bil. Gallons)	U.S.	0.073	0.059	0.047	0.036	0.026	0.017	0.008	0.001	-0.007	-0.013
Price ($/Gallon)	U.S.	4.758	4.498	4.374	4.192	4.051	4.075	4.116	4.126	4.195	4.176
Crushing Margins ($/Pound of SB Oil)	U.S.	2.371	0.903	0.605	0.316	0.070	-0.003	-0.058	-0.138	-0.162	-0.270

Table D-69. Forecast Result for the U.S. Biodiesel Sector under the RFS2

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (Gallons/Pound of SB Oil)	U.S.	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133
Total Supply (Bil. Gallons)	U.S.	0.987	1.032	1.064	1.071	1.107	1.152	1.198	1.245	1.292	1.340
Production (Bil. Gallons)	U.S.	0.985	1.017	1.049	1.056	1.092	1.137	1.183	1.230	1.277	1.325
Domestic Demand (Bil. Gallons)	U.S.	1.280	1.280	1.280	1.280	1.280	1.280	1.280	1.280	1.280	1.280
Net Exports (Bil. Gallons)	U.S.	-0.328	-0.262	-0.231	-0.223	-0.189	-0.144	-0.098	-0.051	-0.003	0.045
Price ($/Gallon)	U.S.	5.063	5.226	4.930	4.963	4.933	4.762	4.719	4.694	4.692	4.719
Crushing Margins ($/Pound of SB Oil)	U.S.	2.679	1.556	1.100	0.969	0.817	0.540	0.395	0.274	0.184	0.125

Table D-70. Forecast Result for the U.S. Biodiesel Sector under the 2014 Farm Bill

Year	Region	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yields (Gallons/Pound of SB Oil)	U.S.	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133	0.133
Total Supply (Bil. Gallons)	U.S.	561.735	596.871	642.920	688.954	735.551	785.573	835.690	885.518	936.249	985.605
Production (Bil. Gallons)	U.S.	559.735	581.871	627.920	673.954	720.551	770.573	820.690	870.518	921.249	970.605
Domestic Demand (Bil. Gallons)	U.S.	453.834	523.182	580.709	637.851	693.881	753.170	811.979	868.719	927.955	981.833
Net Exports (Bil. Gallons)	U.S.	72.982	59.384	47.111	36.162	26.358	17.336	9.012	1.363	-5.750	-12.252
Price ($/Gallon)	U.S.	4.739	4.399	4.286	4.105	3.966	3.991	4.026	4.040	4.105	4.096
Crushing Margins ($/Pound of SB Oil)	U.S.	2.371	0.875	0.605	0.335	0.094	0.028	-0.033	-0.109	-0.138	-0.238

APPENDIX E

SUPPLY AND DEMAND ELASTICITIES

Appendix E contains the supply and demand elasticities with respect to price change.

The elasticities are calculated based on the estimations in Appendix C.

Table E-1. Planted Acre Elasticities with respect to Price in the Corn Belt

Crop		Price									
		Barley	Corn	Cotton	Oats	LG Rice	MSG Rice	Sorghum	Soybean	Wheat	Peanuts
Planted Acres	Barley										
	Corn		0.0382						-0.037		
	Cotton										
	Oats										
	LG Rice										
	MSG Rice										
	Sorghum										
	Soybean		-0.059						0.013		
	Wheat								-0.082	0.087	
	Peanuts										

Table E-2. Planted Acre Elasticities with respect to Price in the Central Plains

Crop		Price									
		Barley	Corn	Cotton	Oats	LG Rice	MSG Rice	Sorghum	Soybean	Wheat	Peanuts
Planted Acres	Barley										
	Corn		0.0114						-0.038		
	Cotton										
	Oats										
	LG Rice										
	MSG Rice										
	Sorghum		-0.138					0.007			
	Soybean		-0.555						0.036		
	Wheat								-0.029	0.014	
	Peanuts										

Table E-3. Planted Acre Elasticities with respect to Price in the Delta States

Crop		Price									
		Barley	Corn	Cotton	Oats	LG Rice	MSG Rice	Sorghum	Soybean	Wheat	Peanuts
Planted Acres	Barley										
	Corn		0.0272						-0.027		
	Cotton			0.051					-0.013		
	Oats										
	LG Rice					0.171					
	MSG Rice						0.613				
	Sorghum										
	Soybean		-0.078						0.016		
	Wheat								-0.005	0.005	
	Peanuts										

Table E-4. Planted Acre Elasticities with respect to Price in the Far West

Crop		Price									
		Barley	Corn	Cotton	Oats	LG Rice	MSG Rice	Sorghum	Soybean	Wheat	Peanuts
Planted Acres	Barley	0.010								-0.015	
	Corn	-0.035	0.0150								
	Cotton		-0.145	0.431							
	Oats		-0.181		0.131						
	LG Rice										
	MSG Rice						0.110				
	Sorghum										
	Soybean										
	Wheat	-0.198								0.081	
	Peanuts										

Table E-5. Planted Acre Elasticities with respect to Price in the Lake States

Crop		Price									
		Barley	Corn	Cotton	Oats	LG Rice	MSG Rice	Sorghum	Soybean	Wheat	Peanuts
Planted Acres	Barley										
	Corn		0.025						-0.033		
	Cotton										
	Oats		-0.851		0.001						
	LG Rice										
	MSG Rice										
	Sorghum										
	Soybean		-0.226						0.048		
	Wheat								-0.059	0.054	
	Peanuts										

Table E-6. Planted Acre Elasticities with respect to Price in the North East

Crop		Price									
		Barley	Corn	Cotton	Oats	LG Rice	MSG Rice	Sorghum	Soybean	Wheat	Peanuts
Planted Acres	Barley										
	Corn		0.008						-0.009		
	Cotton										
	Oats										
	LG Rice										
	MSG Rice										
	Sorghum										
	Soybean		-0.147						0.033		
	Wheat										
	Peanuts										

Table E-7. Planted Acre Elasticities with respect to Price in the Northern Plains

Crop		Price									
		Barley	Corn	Cotton	Oats	LG Rice	MSG Rice	Sorghum	Soybean	Wheat	Peanuts
Planted Acres	Barley	0.011								-0.025	
	Corn		0.001						-0.001		
	Cotton										
	Oats		-0.117		0.044						
	LG Rice										
	MSG Rice										
	Sorghum										
	Soybean		-0.267						0.042		
	Wheat		-0.222							0.051	
	Peanuts										

Table E-8. Planted Acre Elasticities with respect to Price in the South East

Crop		Price									
		Barley	Corn	Cotton	Oats	LG Rice	MSG Rice	Sorghum	Soybean	Wheat	Peanuts
Planted Acres	Barley										
	Corn		0.022						-0.028		
	Cotton			0.001							-0.012
	Oats										
	LG Rice										
	MSG Rice										
	Sorghum										
	Soybean			-0.798					0.004		-1.302
	Wheat									0.019	-1.283
	Peanuts			-0.001							0.001

Table E-9. Planted Acre Elasticities with respect to Price in the Southern Plains

Crop		Price									
		Barley	Corn	Cotton	Oats	LG Rice	MSG Rice	Sorghum	Soybean	Wheat	Peanuts
Planted Acres	Barley										
	Corn		0.037					-0.100			
	Cotton		-0.034	0.567							
	Oats				0.004			-0.020			
	LG Rice										
	MSG Rice										
	Sorghum		-0.502					1.881			
	Soybean										
	Wheat		-0.009							0.002	
	Peanuts										

Table E-10. Planted Acre Elasticities with respect to Price in the U.S.

Crop		Price									
		Barley	Corn	Cotton	Oats	LG Rice	MSG Rice	Sorghum	Soybean	Wheat	Peanuts
Planted Acres	Barley	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.019	0.000
	Corn	-0.001	0.026	0.000	0.000	0.000	0.000	-0.003	-0.030	0.000	0.000
	Cotton	0.000	-0.023	0.338	0.000	0.000	0.000	0.000	-0.002	0.000	-0.003
	Oats	0.000	-0.201	0.000	0.026	0.000	0.000	-0.004	0.000	0.000	0.000
	LG Rice	0.000	0.000	0.000	0.000	0.144	0.000	0.000	0.000	0.000	0.000
	MSG Rice	0.000	0.000	0.000	0.000	0.000	0.249	0.000	0.000	0.000	0.000
	Sorghum	0.000	-0.282	0.000	0.000	0.000	0.000	0.815	0.000	0.000	0.000
	Soybean	0.000	-0.161	-0.006	0.000	0.000	0.000	0.000	0.023	0.000	-0.011
	Wheat	-0.020	-0.067	0.000	0.000	0.000	0.000	0.000	-0.013	0.035	-0.059
	Peanuts	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001

Table E-11. Demand Elasticities with respect to price in the U.S.

Crop	Demand	Price of	Elasticity
Corn	Feed and Residual	Corn	-0.507
		SB Meal	0.023
	Food and Industrial	Corn	-0.158
	Exports	Corn	-0.326
Barley	Feed	Barley	-1.849
		Corn	1.263
	Food	Barley	-0.167
		Corn	0.749
		Sorghum	0.614
	Exports	Barley	-4.412
Cotton	Milling	Cotton	-0.702
	Export	Cotton	-0.218
Oats	Feed	Oats	-0.829
		Corn	0.356
	Food	Oats	-0.197
		Wheat	0.331
	Exports	Oats	-0.058
LG Rice	Domestic and Residual	LG Rice	-0.343
		MSG Rice	0.368
	Exports	LG Rice	-0.547
		Thailand Rice	0.362
MSG Rice	Domestic and Residual	MSG Rice	-0.685
		LG Rice	0.343
	Exports	MSG Rice	-0.628
		Thailand Rice	0.565
Sorghum	Feed	Sorghum	-7.158
		Corn	8.118
	Food	Sorghum	-3.423
		Corn	4.366
		Wheat	-0.705
	Exports	Sorghum	-1.263
Soybeans	Seed, Feed, and Residual	Soybeans	-0.754
		SB Meal	-0.502
	Crushing	Soybeans	-0.380
		SB Meal	0.000
		SB Oil	0.091
	Exports	Soybeans	-0.293
SB Meal	Domestic	SB Meal	-0.083
	Exports	SB Meal	-0.296
SB Oil	Domestic	SB Oil	-0.359
		Other Oil	0.243
	Exports	SB Oil	-0.683
		Other Oil	0.877
Wheat	Feed and Residual	Wheat	-12.155
		Corn	6.030
		SB Meal	4.695
	Food	Wheat	-0.051
		Sorghum	0.048
	Exports	Wheat	-0.208
Peanuts	Crushing	Peanuts	-0.773
	Export	Peanuts	-1.085

APPENDIX F

MARKETING YEAR AND CONVERSION FACTORS

Table F-1. Marketing Year by Crop

Crop	Marketing Year
Corn	September - August
Barley	June - May
Upland Cotton	August - July
Oats	June - May
LG Rice	August - July
MSG Rice	August - July
Grain Sorghum	September - August
Soybeans	September - August
Soybean Meal	October - September
Soybean Oil	October - September
Wheat	June - May
Peanuts	August - July

Source: USDA ERS.

Table F-2. Conversion Factors by Crop

Crop	Conversion Factors
Corn	1 Bushel = 56 Pounds 1 Ton = 39.3976 Bushels
Barley	1 Bushel = 48 Pounds 1 Ton = 45.9296 Bushels
Upland Cotton	1 480lb Bales = 480 Pounds
Oats	1 Bushel = 32 Pounds 1 Ton = 68.8944 Bushels
LG Rice	1 Cwt = 100 Pounds
MSG Rice	1 Cwt = 100 Pounds
Grain Sorghum	1 Bushel = 56 Pounds 1 Ton = 39.3976 Bushels
Soybeans	1 Bushel = 60 Pounds 1 Ton = 36.7437 Bushels
Soybean Meal	1 Short Ton = 2,000 Pounds
Wheat	1 Bushel = 60 Pounds 1 Ton = 36.7437 Bushels
Peanuts	1 Ton = 2204.622 Pounds